

Discussion on the Strategy of Improving Class Efficiency in Physics Teaching of Senior High School

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Abstract: In the field of education, the classroom is the main place for students to learn knowledge, cultivate skills and train thinking, and improving classroom efficiency is of vital significance for students' learning and future development. As a subject that requires high levels of abstract thinking and experimental skills, the importance of classroom teaching efficiency in high school physics is particularly prominent. This paper discusses how to improve the efficiency of high school physics classroom teaching in view of the disadvantages of high school physics teaching, aiming to provide some useful references for middle school physics teachers.

Keywords: Physics teaching of high school; Class efficiency; Strategy

Introduction

High school physics teaching is an important activity to cultivate students' physics subject literacy and scientific inquiry ability, but due to the difficulty of high school physics courses and students' lack of interest in learning, the efficiency of physics classes is often not high. How to improve the classroom efficiency of high school physics teaching has become an urgent problem to be solved. In view of the practical problems existing in the current high school physics classroom teaching, this paper discusses how to improve the efficiency of high school physics classroom teaching, in order to provide some useful references for the majority of middle school physics teachers.

1.The Significance of Improving Classroom Efficiency in High School Physics Teaching

1.1. Cultivation of Students' Core Literacy in Physics

Physics core literacy is the literacy that students must possess in physics learning, including physical concepts, scientific thinking, experimental inquiry, and scientific attitude and responsibility. Improving classroom efficiency can cultivate students' physics core literacy better. In an efficient physics classroom, students can understand physics concepts and laws, master physics experimental skills and methods, and form scientific thinking and attitudes better, so as to adapt to future study and life better.



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1.2. Improvement of Students' Performance in Physics

Improving students' performance in physics is a realistic goal of all physics teachers' classroom teaching, and only by improving classroom efficiency can students grasp the knowledge and skills and improve students' academic performance better^[1]. In an effective physics classroom, students are able to better understand physics concepts and laws, master problem-solving methods and skills, and thus achieve better results in exams.

1.3. Stimulation of Students' Interest in Physics Learning

It is a common saying that, "Interest is the best teacher". Improving classroom efficiency can stimulate students' interest in physics learning. In an effective physics classroom, teachers can attract students' attention, stimulate students' interest in learning, and make students participate more actively in learning through vivid and interesting examples, intuitive experiments, and enlightening questions. If classroom efficiency can be improved, students can feel the joy of learning and increase their sense of accomplishment in learning better.

1.4. Relief of the Homework Burden of the Student

Although the Ministry of Education has asked repeatedly to reduce the burden on students, the current high school students' homework burden is still very heavy. In an efficient physics classroom, students can master knowledge and skills profoundly, and the time for learning physics after class will be reduced, which can help students balance the learning time of various subjects, and student life will be more relaxed and enjoyable.

1.5. Improvement of the Teaching Level and Professional Quality of Teachers

Teachers need to have solid basic teaching skills, rich teaching experience and advanced teaching concepts in order to guide students' learning, stimulate students' interest in learning, and improve students' academic performance better. At the same time, teachers also need to constantly learn and update their knowledge structure, master the latest educational technology and teaching methods, and constantly improve their professional quality and teaching level. Therefore, improving classroom efficiency is helpful to force the

majority of middle school physics teachers to improve their teaching level and professional quality.

2. Problems Existing in the Teaching of High School Physics

As an important part of the education system, high school physics teaching is of great significance for cultivating students' scientific literacy and physics knowledge^[2]. However, in actual teaching, there are still some problems in high school physics teaching, which hinder the improvement of teaching quality and the all-round development of students.

2.1. Abstractness of the Teaching Content

The concepts and principles involved in high school physics, such as mechanics, electromagnetism, optics, are relatively abstract, which are difficult for students to understand. Teachers usually pay attention to the explanation of formulas and theories in teaching, but ignore the connection with real life, which makes it difficult for students to apply what they have learned in practice. In addition, teachers pay too much attention to the teaching of problem-solving skills and test-taking strategies, while ignoring the in-depth explanation and exploration of physical principles, which makes it difficult for students to truly understand physics knowledge.

2.2. Monotony of the Teaching Methodology

Many teachers use traditional teaching methods, such as "cramming" teaching, ignoring the subjective position of students. This single teaching method makes the classroom atmosphere dull, and students lack the enthusiasm and initiative to learn. At the same time, teachers often only focus on students' test scores, but ignore the cultivation of students' inquiry ability and innovative thinking. This makes students lack thinking and innovation in learning, and cannot truly grasp the knowledge of physics.

2.3. Particular Lack of the Physical Experiments

Physics experiments are an important means to help students understand the principles of physics and improve their practical ability. In some schools, students often lack experimental opportunities due to incomplete experimental equipment and limited course time. This makes it difficult for students to consolidate what they have learned through practice, and also affects the cultivation of students' scientific literacy.

Especially, some schools have even canceled physics lab classes, leaving students unable to truly experience the practical application of physics principles.

2.4. Extreme Unscientificness of the Evaluation Method

The traditional evaluation method is mainly based on test scores, and there are some problems with this evaluation method. First of all, the content of the test tends to focus on memorization of knowledge, and ignores the examination of students' practical application ability. As a result, students focus too much on memorization rather than comprehension, resulting in students being unable to apply what they have learned to the real world^[3]. Secondly, this kind of evaluation method can easily lead students to have a test-taking mentality and ignore the in-depth understanding and exploration of knowledge. Students tend to only pay attention to the content of the examination and ignore the development of other aspects, which has a negative impact on the long-term development of students and the improvement of their overall quality.

3. Strategies to Improve the Class Effectiveness of High School Physics Teaching

The solution to the problem of high school physics teaching needs to be considered and implemented from many aspects, and the following are some specific measures:

3.1. Increase of Practical Application Examples

In order to improve the teaching efficiency of high school physics classrooms, teachers can add practical application examples to help students understand physics concepts and principles better. As is known to all, physics is closely related to our daily life. Therefore, teachers can start from the phenomena in daily life and the application of science and technology, so that students can connect what they have learned with real life, and improve their interest and enthusiasm in learning.

For example, when explaining the principles of mechanics, teachers can use the application of mechanics principles in automobile design and manufacturing as an example to organize teaching. Automobiles are common means of transportation in our daily lives, and allowing students to think about how to apply the principles of mechanics in the design

and manufacture of automobiles can improve their understanding and mastery of mechanical knowledge. Teachers can guide students to analyze the shape and structure of the car, discuss the various forces experienced by the car while driving, and how to optimize the car's performance by changing the shape and structure of the car. This teaching method can not only help students better understand the principles of mechanics, but also improve their interest and motivation to learn.

In addition, teachers can also introduce examples of technology applications to stimulate students' interest in learning. For example, when explaining the principles of electromagnetism, teachers can introduce the working principles of household appliances such as induction cookers and microwave ovens, so that students can understand the application of electromagnetism in real life. Through these practical examples, teachers can help students understand physics better and improve their motivation to learn, thereby promoting the improvement of teaching efficiency.

3.2. Adoption of Diverse Teaching Methods

In order to improve students' learning outcomes, teachers can adopt a variety of teaching methods, such as inquiry-based teaching and cooperative learning. These teaching methods allow students to participate in the classroom better and increase their motivation and initiative in learning. Inquiry-based teaching is a teaching method that uses inquiry as the main means to guide students to explore independently, so that they can better understand physics knowledge in the process of inquiry. In inquiry-based teaching, teachers can set up questions or experiments for students to find answers and draw conclusions through independent inquiry. This teaching method can develop students' independent thinking and problem-solving skills, while also promoting students' in-depth understanding and mastery of knowledge. Cooperative learning is a small group teaching method that develops students' cooperative spirit and communication skills, while also promoting students' in-depth inquiry into knowledge. In cooperative learning, teachers can group students according to their actual situation, and let students work in groups to complete tasks or solve problems. This teaching method can stimulate students' interest and motivation to learn, while also improving their

learning effectiveness and self-confidence.

In addition, teachers can also use multimedia technology to assist teaching, and help students understand physical phenomena and processes better through simulation experiments and animation demonstrations. Multimedia technology can make abstract physics knowledge more vivid and vivid, and help students understand and master physical concepts and principles better. For example, when explaining the propagation principle of electromagnetic waves, teachers can use animation to demonstrate the propagation process of electromagnetic waves, so that students can more intuitively understand the propagation methods and characteristics of electromagnetic waves.

3.3. Enrichment of Various Forms of Experimental Activities

As the saying goes, "sharpen the knife without cutting wood". In the teaching of physics in the classroom, schools and teachers must overcome the subjective and objective difficulties, purchase experimental equipment, ensure the time of experimental courses, raise awareness, and effectively carry out various forms of experimental activities. Teachers should make full use of various forms of experimental activities such as demonstration experiments and group experiments to improve classroom efficiency and teaching effectiveness.

First of all, adding experimental activities can stimulate students' interest in physics^[4]. Through hands-on observation and experimentation, students can feel the wonder and interest of physical phenomena, so that they can be more actively engaged in learning. Second, experiments can help students understand physics concepts better. Many abstract physical concepts such as electromagnetic waves and quantum mechanics, can be demonstrated and operated through experiments, which can make students understand these concepts more intuitively and improve classroom efficiency. In addition, experiments can also develop students' practical skills. In the process of operating experiments, students need to carefully observe, record data, and analyze the results, which requires them to have a certain degree of practical ability. Through experiments, students can exercise their observational, analytical, and problem-solving skills.

3.4. Establishment of the Scientific Evaluation System

Firstly, the evaluation content should not only include exam scores, but also consider students' practical application abilities, learning attitudes, and cooperative spirit, which can encourage students to apply the knowledge they have learned to real-life situations and improve their problem-solving abilities. At the same time, the evaluation content should also pay attention to the learning process and attitude of students, in order to guide them to form correct learning concepts and values. Secondly, the evaluation methods should be diversified. In addition to traditional exam score evaluation, teachers can also use the following methods for evaluation: first, observation method. Teachers can understand students' learning situation and practical application abilities by observing their performance in the classroom, experimental operations, group discussions, and other activities. Second, the work evaluation method. Teachers can ask students to complete some practical projects or lab reports, and evaluate them based on their completion. This method can test students' practical skills and knowledge application ability. Third, the examination method. Exams are still an important form of assessment. Teachers can flexibly use written tests, oral tests, laboratory examinations and other forms to fully understand the learning situation of students according to the teaching content and teaching objectives.

3.5. Improvement of the Professional Quality of Physics Teachers

Teachers are the organizers of physics classrooms, the leaders of classroom teaching, and the guides for students to learn physical science. The teaching methods and teaching art of each physics teacher directly determine the efficiency of the classroom. First of all, physics teachers need to take the initiative to strengthen their learning and continuously improve their subject knowledge and teaching ability. This includes an in-depth understanding of high school physics textbooks, mastery of various teaching methods and techniques, and the ability to use pedagogy and psychology knowledge to influence students. Only by continuous learning can we make ourselves handy in teaching practice and better serve our own teaching. Secondly, teachers should conscientiously

carry out collective lesson preparation, strengthen teaching research, actively communicate with other colleagues, and learn from each other's teaching experience and skills. By observing other teachers' classroom teaching, learning their teaching methods and strategies, and exchanging experiences with them, one who participates in collective lesson preparation can continuously improve their own teaching skills. At the same time, participating in various teaching and research activities and academic conferences also helps to understand the latest educational trends. Thirdly, teachers need to improve their own level of humor^[5]. Appropriate humor in physics classes helps to liven up the classroom atmosphere, reduce student anxiety levels^[6], capture their attention, and regain control of the classroom. Finally, teachers who participate in training and learning can update their teaching concepts and master new educational methods further. Training and learning is an important way for teachers to continuously improve themselves, which can help teachers understand the latest educational concepts and methods, so as to apply them to their own teaching practice better.

Conclusion

In the face of this new topic, physics teachers should keep pace with the times, adopt a variety of strategies, stimulate students' enthusiasm for learning, expand the content of teaching materials, and improve the effect of physics teaching by strengthening experimental teaching and using modern teaching techniques. In the

future, with the deepening of education reform and the continuous development of educational technology, it is believed that these strategies and methods will be more enriched and improved, and then play a greater role in improving the quality and level of high school physics teaching.

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