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Research on the Teaching Strategy of Physics in Middle School under the Background of "Internet + Education"

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Abstract

With the substantial improvement of China's comprehensive level, traditional industries began to seek further development. People have seen new opportunities from the development of the Internet, and began to explore ways to combine internet technology with traditional industries. In the education industry, it is very hard for the traditional education model to make significant progress because of its inherent model. However, the education combined with the internet has obvious advantages over traditional education because of its flexibility in time and space and the addition of technology. Therefore, the arrival of the "Internet + Education" model has opened a new chapter for China's education industry. In the teaching field, for physics teaching in middle schools, it is the key to study how to optimize the teaching strategies of physics in middle schools in the context of "internet +".

Keywords

“Internet +”; Teaching Strategy of Physics in Middle School.

1. Introduction

Along with the rapid development of information technology, people's awareness and recognition of "Internet + education" is gradually increasing. In the past, the teacher was the main body of the class [1]. The common situation we often saw was that the teacher stood on the platform with teaching reference on the desk, imparting knowledge to the students face to face, or turning around to write and draw on the blackboard[2-4]. The effect of this education model will not be too good nor too bad. Because teachers, as the main body of imparting knowledge, spread knowledge word by word. And students will draw knowledge directly and learn the key points and difficulties from teachers. Moreover, the teachers are involved in the whole process of teaching, and the teachers will have a certain understanding of the whole class and everyone's learning situation. These are the advantages of the traditional teaching model. However, this teacher-centered teaching model, in which oral presentation and board books are the main means of instruction, has great limitations.

With the development and popularization of "Internet + Education", the problems of limited teaching time and different students' acceptance ability in traditional teaching mode have been solved. Students can open the teaching websites and teaching videos on the Internet anytime and anywhere, and study repeatedly, thus expanding the learning time and increasing students' autonomy. Teachers can design video animation to show students the knowledge points that cannot be clearly expressed by language description alone[5-7]. The visual demonstration can stimulate students' interest in learning and make students understand knowledge points more deeply. As a new form of education that combines Internet technology and education, "Internet + Education" will have a profound impact on education[8].

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2. Teaching Strategy of Physics in Middle School

Teaching strategy is a systematic teaching behavior of a teacher that aims to achieve certain teaching goals. A mature and appropriate teaching strategy can improve the effectiveness of teaching.

2.1. Productive Teaching Strategy

Productive teaching strategy refers to a teaching strategy in which teachers help students learn independently under the guidance of their own teaching objectives, so as to find a set of learning methods suitable for their own situation. Productive teaching can cultivate students' autonomous learning ability. Through the guidance of teachers, students can independently discover problems, make plans, and work out suitable and efficient learning methods for themselves. Less shackles set by teachers will help students to spread their thinking and make them more active in scientific inquiry[9]. However, due to the decrease of teachers' participation, some students may have their own limitations, which may lead to wrong learning methods and reduced learning enthusiasm. In this way, it is not conducive to the development of this strategy in the future.

Therefore, the implementation of this teaching strategy greatly depends on the guidance of teachers. If teachers can help students to make a correct study plan, students can learn independently and efficiently under the positive impetus of teachers.

2.2. Concept Transformation Strategy

Concept transformation strategy is to break students' original misconceptions, and help them to establish new and correct concepts. This whole process can be seen as the transformation of old experience by new concepts[10]. For example, when studying the chapter "Gravity", students, based on their past life experience, take it for granted that a piece of paper falls faster than when it is unfolded because the former has greater gravity than the latter. Because they had a wrong experience before, that is, “the faster falling speed of the object” equals “the heavier weight of the object” equals “the larger gravity of the object”. The reason for this cognitive error is that they ignore the relationship between the motion and resultant force of the object, and that the object is not only subjected to gravity, but also to air resistance. Therefore, to help them reverse this point of view, the teachers must first explain the physical concepts clearly, and then explain to them the relationships among the physical concepts.

2.3. Task-driven Strategy

Task-driven teaching strategy is based on constructivism which takes students as the main body[11]. In the teaching process, the whole teaching process is dominated by "tasks". Students can explore and learn by receiving tasks, find and solve problems independently. This teaching method greatly promotes students' innovative ability and autonomous learning ability. In simple terms, Task-driven means that teachers set appropriate tasks to promote students to explore and complete independently. After a task is assigned by the teacher, students have a learning goal. Towards this goal, students can find problems, learn knowledge points, solve problems through exploration and research, and finally acquire the access and reserve of knowledge. Moreover, in this mode, teachers can divide students into groups and let them work together to explore and study a certain topic. Through intra-group cooperation and competition between groups, students will be more interested in the teaching contents.

2.4. Graphical Strategy

Graphical strategy is to show the process of knowledge construction in mind in a graphical way. Reasonable use of the graphic strategy is beneficial for students to master the overall framework, sort out the context of knowledge and deal with physical problems clearly.

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Graphical strategies are divided into "concept map" and "mind map". Graphical strategy is more vivid and interesting than pure text teaching. However its structure is too complicated, and it is difficult to include all the knowledge points. Therefore we need to use Internet technology to achieve higher-level teaching requirements.

3. Coping Strategies of Physics Teaching in Middle School in the Context of "Internet +Education"

3.1. Teaching Links of Middle School Physics in the Context of "Internet +Education"

3.1.1. Preparation Stage of the Teacher

According to the teaching content, teachers create teaching situations, formulate teaching objectives and set teaching evaluation with the help of teaching resources. Teachers prepare 5-15 minutes of micro-videos for students to preview, and pay attention to micro-videos and highlight the key points of this class. Regarding the teaching situation, teachers should pay attention to bring up the classroom atmosphere, which is enlightening to some extent. In the aspect of teaching evaluation, teachers should consider the differences between students and make evaluation about students reasonably.

3.1.2. Students Preview Online Independently

Before class, students use the Internet to open the micro video provided by teachers to preview before the class started, so as to understand the curriculum objectives, difficulties and other contents of this class. Then conduct online pre-class training, find out the defects in knowledge content through pre-class training. And if they encounter problems that they can't answer or answer incorrectly by themselves, students can watch video and learn again, or they can ask for help from teachers online to answer questions, or wait until class for group discussion.

3.1.3. Classroom Interactive Inquiry

First of all, the teacher uses the classroom scenario he or she created to guide students to ask questions, which they explore on their own or discuss in small groups. Thereafter, the teacher tests the results of the students' inquiry, then the teacher and students discuss and communicate with each other. Through discussion and communication with students, teachers can find out how well we have mastered the important and difficult knowledge in this chapter, and then they can target to explain those points that students have not mastered in class.

3.1.4. Improvement after Class

After class, students log in to the answering platform of the learning website to have a chapter knowledge test. After answering the questions, students can learn about their mastery of knowledge points through the information fed back by the platform, and then analyze the test scores. For the questions that have not been answered correctly, students can selectively watch the teaching video again to check to fill in the gaps, or they can also search the information online to find the answers. Teachers then will understand more of students' mastery of the knowledge content of this lesson according to the test feedback of class students, so as to get rid of the deficiencies and improve the teaching design.

3.2. Coping Strategies of Physics Teachers in Middle School in the Context of "Internet +Education"

3.2.1. Make Good Production of the Early Teaching Videos to Enrich the Teaching Contents

Teachers should make teaching videos and test questions according to the physical foundation of students in the class. Teaching videos should be rich in content, and explanations should be lively and interesting. The questions should be moderately difficult and well differentiated. Also

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teachers should pay attention to concise and clear language and highlight key points. The teaching level should be from easy to difficult, from shallow to deep. And, it should be of clear logic in terms of the teaching methods.

3.2.2. Teaching Methods should be Flexible and Diverse with the Help of Advanced Internet Information Technology

Previously, the traditional teaching methods are explanation and blackboard writing. At present, the development of Internet confidence technology is changing with each passing day. Teachers can use advanced Internet information technology to make teaching methods flexible and diverse. In addition to the blackboard used before, now there are also multimedia teaching equipment such as computers, projectors and mobile phones. For example, when explaining the content of "magnetic field", teachers can insert experimental video clips of small magnetic needles stressed in the magnetic field as a new lesson introduction to increase students' interest in inquiry.

3.2.3. Teachers and Students Can Communicate with Each Other Anytime and Anywhere by Using Internet Communication Technology

In the past, it is always teachers talking in the classroom while students listening in class. There was not enough interaction and communication between teachers and students, which led to students' sense of distance from teachers. In such circumstances, the students lack the opportunities and places to discuss problems with teachers or classmates; teachers can not accurately understand students' mastery of classroom content. By using Internet communication technology, teachers can communicate and discuss with students online anytime and anywhere, and they can also publish the results of the discussion on the extracurricular learning website. So that all students can see and participate in the discussion, which is conducive to the in-depth interaction between teachers and students.

3.2.4. Teachers can Make Use of Internet Information Technology to Conduct Hierarchical Teaching, so as to Teach Students in Accordance with Their Aptitude

Each student has different learning abilities as well as different levels of knowledge mastery. If teachers ask students to meet the same standards, the gap between class performances will become larger and larger. Through Internet information technology, teachers can assign different levels of learning tasks to different students and push different teaching resources. After the students have completed their knowledge learning within the specified time, the teachers will give separate feedback according to the actual situation of students' learning.

3.2.5. Teachers can Use Internet Technology to Develop Experimental Teaching Resources

In the middle school physics teaching process, in addition to the explanation of theoretical knowledge, experimental teaching is also very important. Many physical laws are obtained or confirmed by experiments, and teachers should also pay attention to the development and utilization of experimental teaching resources. Besides the experimental equipment in textbooks, teachers can also make similar equipment to help students to understand. After the experiment, the teachers can also record and broadcast the experimental class, record the students' experimental process and make it into a micro-class. Students can watch the video of their own experiments during the review, which will greatly deepen their impression of the experiment.

4. Conclusion

This thesis is a research on the teaching strategy of physics in middle schools in the context of "Internet + education". It is not only a simple combination of Internet and teaching, but also a

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transformation of teaching design concept and an innovation of teaching mode by considering the enlightenment of Internet to teaching design. It is hoped that through the study of "Internet + education" theory and instructional design theory, various technologies in the Internet era will be applied into traditional physics teaching. So that students' interest in learning will be stronger, and the learning methods and approaches will be more diversified, and personalized learning will become possible.

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