

On the Scientific Nature and Exploratory Implementation of Physics Teaching

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Abstract: Progress is possible only when man sees himself not as a tool but as a citizen of independent will. This is especially true of teachers for education." The existing education emphasizes subjective initiative and self-construction theory, so the process of physics education should pay more attention to its science and inquiry.

Keywords: Physics teaching; Teaching methods; Curriculum reform

1. Introduction

In recent years, although high school physics teaching has been in continuous change, continuous improvement, from our basic textbook teaching more practice demonstration teaching, laboratory teaching, etc. It has been trying a variety of teaching forms and methods while students' learning method and teachers' teaching method being constantly explored and improved. "We should not only study the psychological law of students, but also study the teaching behavior of teachers." Based on educational psychology, we are constantly looking for a physical teaching model suitable for students' physical and mental development and can achieve the maximum teaching effect. With the continuous adjustment and improvement of the education system, we gradually realize the importance of "applying knowledge to practice", which emphasizes the practical life and self-innovation of knowledge. For teachers, it is also a higher expectation for applied teaching. Teachers are required to get close to life in the teaching process and inspire students' main body initiative to make them interested and consciously study and explore.

But at present, students who finish secondary school only have a superficial knowledge of physics, as well as other science related knowledge, and are not able to idealize the connection between science and technology.^[1]The teaching of physics course bears the task of imparting the basic physical science knowledge to students, and is responsible for the task of cultivating students' practical application skills. But at present, many schools deviate from the goal of training students by placing too much emphasis on the inculcation of theoretical knowledge and neglecting the cultivation of practical application ability of knowledge. Especially for basic subjects like physics, students often feel that the knowledge they have learned is not useful in the learning process, so it is difficult to master it and the teaching effect is not good.

2. Based on it, We'll find something thoughtful

In the process of physics learning, students need to discover and explore from life and scientific phenomenon in order to truly understand its essence.^[2]In fact, the inner mechanism of students is particularly crucial when solving practical problems in physics education. In order to help and guide students to carry out inquiry study in life in the classroom with limited time and resources, it requires us teachers to create problem situation. Effective problem situation creation is very necessary and key for physics inquiry teaching.

In our daily physical education and teaching process, we can consider from two aspects of teaching content and teaching methods: (1) Introduce to students the new development, achievements and achievements of science and technology and the knowledge and technology closely related to industry, agriculture and medicine according to the teaching objectives and combined with the teaching content. Such as the acquisition and application of superconductors; Effects of electromagnetic field on crop growth. (2) Guide students to explore based on their original knowledge and life experience by combining a series of practical problems raised by students' daily life and industrial and agricultural production, and finally solve the practical problems raised. (3) In the teaching process, try as much as possible to provide students with brain, hands-on opportunities, so that students through their own design of experimental programs, experimental operations to solve a practical problem. (4) Encourage students to participate in the research of major social problems, such as environmental protection, energy crisis, noise pollution, etc., encourage students to use their physics knowledge to try to solve these practical problems.

3. The methods we can use in physics teaching are

3.1 Inquiry-based education and teaching, as the name implies, is an educational and teaching activity based on inquiry

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And what is inquiry, that is, on the basis of existing knowledge, to think more deeply about the status quo, that is, to the existing conclusions are not satisfied, so as to form a certain height, new goals, the gap between the goal and the status quo and then become contradictions and difficulties, and then to find ways to further solve the conflict and difficulties. So is the education teaching as a teacher, we in the whole process of physical education, on the thinking and logic to certain guidance to help students, make students subjectively produce are not satisfied with the status quo, for does not meet the existing knowledge, also is to have a certain interest to deep thinking, to form a certain contradiction to ask questions. Curriculum reform requires "teachers in the teaching process should interact with students actively and common development, to correctly handle the relationship between imparting knowledge and cultivating ability, pay attention to cultivate the students' independence and autonomy, guide students to question, investigate, explore, learn in practice, promote the students actively, rich individual character under teacher's guidance to learn". That is to say, in the process of physics teaching, teachers are required to develop and improve the teaching method to the direction of interaction and guidance, change the previous spoon-feeding or infusing teaching mode, and pay more attention to guiding students to think and learn by themselves. So in the process of physics teaching, teachers are required to depict abstract knowledge points in physics with rich image teaching means as far as possible, ask questions from the technical level, let students contact reality, explore learning, not only can greatly mobilize students' interest, but also can guide students to think and construct themselves.

3.2 Problem situation creation

Problem situation is an objective psychological state based on real society and subjective emotion. Due to the existence of this state, students will appear cognitive conflict to a certain extent, curiosity and thirst for knowledge will make students have great interest in a certain phenomenon, so as to take the initiative to ask questions, that is, to complete the primary task of inquiry teaching -- to ask questions. For example, in the teaching of "Several factors affecting buoyancy", we have mastered the simple meaning of buoyancy and understood the reason why a ship can float on the sea because water produces buoyancy for the ship. So now we put an egg in a glass of water, and we see the egg sink, and we keep adding salt to the water and we stir it, and slowly, we see the egg magically come up. The students for this "first sink and float" phenomenon of wonder and curiosity, this phenomenon was new, unknown for them, then they will think, in this kind of problem situation, when they found themselves for their existing knowledge don't meet won't solve the present cognitive conflict, they will ask "why?" In this way, we can help to put forward new knowledge points, so that they adapt to the new knowledge to understand the problem, and finally master the new knowledge. "Questions are the starting point of inquiry teaching. There can be no inquiry without questions." Inquiry teaching starts with problems, combines existing knowledge, analyzes and thinks to further draw deeper conclusions. So how can let the student produce question, raise question? We know the problem stems from a curious psychology, then as a teacher, we need to do is to arouse the students' curiosity for the unknown knowledge and curiosity, this requests us to guide to help students achieve a "targeted but don't know how to achieve psychological difficulties" state, which would require to carry out the creation of problem situation. That is, based on social phenomena, to ask questions, to think, combined with existing technology or hypothesis, scientific learning. Students need to acquire new knowledge on the basis of existing knowledge and life experience through inquiry and thinking. We must consider the acceptability of students when creating problem situations, and avoid "teaching new knowledge with new knowledge", which will not only fail to arouse students' interest, but also make them more confused. Therefore, when creating problem situations, we should try to select some simple situations close to life, with students as the main body to choose the creation.

4. Epilogue

Rapid development of modern science and technology today, we need to further perfect in scientific education teaching method and content, as far as possible, conform to the requirements of the new standard, in the usual in physics teaching in science, technology and society, that is, from the perspective of the social environment, and guide students to question assumptions, and integrated into the existing or default, the technology of finishing the study of science. The learner-centered teaching of physics in senior high school is carried out from the standpoint of students' learning, which circulates in the whole teaching process through activating old knowledge, self-construction, transferring application and integrating reflection. "All knowledge begins with the senses," said The Czech educator Comenius. Therefore, arousing curiosity and thirst for knowledge is the basis of acquiring knowledge. Our teaching can no longer be the so-called "knowledge indoctrination", but more to guide students to have the desire for knowledge emotionally, encourage students to divergent thinking and independent thinking, and emphasize the "subjectivity" and "initiative" of students in physics study. It is of great significance for effective teaching and efficient learning to pay attention to students' learning, learn actively and learn with individuality. The rapid development of economy needs science and technology, so in the process of basic physical science learning, we will link society and technology application, so that students can learn physics in society and application, and understand that science and technology is to serve the development of social production and the improvement of life quality.

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