Promoting the Reform of College Physics Teaching with the Guidance of Student Development

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Keywords: University physics, Problem awareness, Innovation ability

Abstract: The development of knowledge economy and social economy has made the demand of the society for talents more diversified. Based on this background, the article first points out the development direction of college students. Then, based on the development of students, this paper analyzes the reform direction of university physics teaching. The content is mainly based on the cultivation of problem consciousness, innovative thinking and innovation ability for physics teachers. reference.

1. Introduction

In the guiding norms promulgated by the Ministry of Education for the University Physics, it is clearly stipulated that "the teaching tasks of university physics should be guided by student development, and cultivate innovative thinking, problem awareness and scientific research ability". University physics teachers should change their educational concepts in a timely manner. From the perspective of promoting students' development, they should cultivate students' scientific literacy, innovative thinking and problem awareness, so that they can become talents that meet social needs.

2. The Development Direction of College Students

2.1 Problem Awareness

In the process of carrying out teaching activities, the task of the teacher is to ensure that each student can participate in the classroom, to improve the personality of the students, complete the work of cultivating the problem awareness, and promote the all-round development of the students. From the perspective of physics teachers, in order to make students have a good sense of problem, the key is to reform the concept of education and teaching mode. Based on the actual situation, based on the ability of students to discover and ask questions, the corresponding The teaching plan encourages students to explore the results of the problem[1]. Practice has proved that only by forming a good problem awareness, the student's thinking will become more active, and the follow-up teaching activities can naturally achieve the same effect as expected.

2.2 Innovative Thinking

In today's society, the demand for innovative talents in various fields has become more and more intense, and university physics has a prominent role in cultivating students' innovative thinking. There are two forms of innovative thinking that exist as the core of innovation ability: convergent thinking and divergent thinking. Convergent thinking refers to the form of thinking that seeks the only correct answer, often with the characteristics of careful verification; divergent thinking refers to the form of thinking that seeks multiple answers, characterized by bold assumptions. In the process of analyzing and solving problems, people's thinking should be divergent to convergent, and then from convergence to divergence. This is because only after many cycles can the problem be fundamentally solved.

2.3 Innovation Ability

Innovative ability is a kind of psychological quality, which is often used to provide value and original products. At this stage, according to the level of innovation, the ability to innovate is

divided into two categories: special talents and self-realization. Among them, the subject of innovation ability corresponding to special talents is usually an outstanding person. The product is naturally the first creation of human society, and the innovation corresponding to self-realization. The main body of ability is the ordinary person, the originality of the product, often only for the innovator, not the other person or the entire human society, although the degree of difference between the two, but in terms of nature, has a certain interoperability.

3. The Direction of University Physics Teaching Reform

The role of university physics is not only to teach students the systematic physics knowledge, but also to cultivate students' problem awareness, innovative thinking and ability to achieve the allround development of students. In today's society where science and technology are constantly evolving, reforming the physics teaching model becomes inevitable. Only by taking students' development as the guide and determining the corresponding teaching methods can the value of physics teaching be fully realized. In the process, the following content requires teachers. Arouse attention:

3.1 Changing the Teaching Mode

In the traditional concept of education, teachers are in a dominant position in the classroom, and the task is to transfer knowledge in one direction. This will lead to students' excessive dependence on teachers, which will affect the development of their self-learning ability. It can be seen that changing the teaching mode and replacing one-way communication with two-way communication has outstanding practical significance. Practice has proved that only by changing the teaching mode in time and adjusting the original teacher-student relationship can students develop the habit of expressing their own ideas. This is very beneficial to the improvement of self-learning ability. For example, when teaching the content of speed and acceleration, teachers can guide students to think about "the connection between force and acceleration" by asking questions. In this process, the teacher's task is mainly to give students guidance to students. The ability to think is cultivated rather than one-way transfer of knowledge.

3.2 Conducting Heuristic Teaching

College physics teaching should abandon the traditional inculcation teaching method, and take the situational creation as the core teaching mode as the main direction of reform. By rationally applying the heuristic teaching method, students should be divergent thinking, so as to achieve the awareness of students' problems. Cultivating teaching objectives. Although the content of physics classrooms is mainly aimed at concepts, principles, formulas and specific applications, teaching and testing are carried out. However, the essence of physics is physical thinking, and only the tactics of leaving the sea can be guided to guide students to actively think about physics and Phenomenon, indepth exploration of the application of the knowledge learned in real life, can make students have a more personal experience of the fun and charm of physics, thus laying the foundation for the realization of the goal of student development. Through the above analysis, we can learn The key to student problem awareness is scenario creation, which requires teachers to give students enough respect, create a harmonious, relaxed and democratic learning situation, and help students build strong self-confidence. For example, when teaching Newton's law, teachers can pass Introduce the way of Newton's life, attract students' attention, and then play related videos to stimulate students. Interest, so that students have some understanding of Newton's contributions to carry out teaching activities on this basis, often can get a multiplier effect[2].

3.3 Applying Multimedia

With the development of information technology, technologies such as the Internet and computers have been widely used in many fields including teaching. The rational application of multimedia in the teaching process not only reduces the pressure on teachers, but also provides students with a difference from the past. The physics space lays the foundation for the cultivation of

students' innovative thinking. Physics has a strong abstraction, some ideas and principles do not satisfy the intuitive and visible conditions, and the chances of contact or application in real life are small, for example, Newton's second law can only be understood through continuous research. However, the classroom time is limited, teachers can not repeatedly preach relevant content, the teaching effectiveness is naturally affected, in order to fundamentally solve the problem, the multimedia technology such as ppt Application is necessary. This will not only make the teaching model more scientific, but also reduce the difficulty for students to understand and master relevant knowledge points. The time students can use to think creatively will naturally become more, which is for students' development. Has an important meaning.

3.4 Combination of Theory and Practice Teaching

The university physics teaching guided by student development should focus on cultivating students' innovative thinking and ability. Specifically, it is a combination of theoretical and practical teaching, and in physics experiments, innovative thinking. It is embodied to lay the foundation for the deep development of students. For physics, the key to discovering problems is to constantly question and think. The way to verify thinking is to analyze and solve problems. It can be seen that the tasks of university physics teachers are not limited. The transfer of knowledge also includes the development of students' experimental ability, so that students can verify their own ideas, innovative thinking and ability in the process of repeated practice, and thus will develop to varying degrees.

At this stage, most universities already have laboratories with rich physical laboratory equipment. The purpose of this is to hope that through the implementation of the open experimental teaching mode, the constraints of the experiment in space and time will be broken, so as to achieve the exercise of students. The teaching purpose of practical ability enables students to develop the habit of analyzing and solving problems from the perspective of physics. In the teaching process, there are two main tasks for teachers. One is to guide students from the professional point of view and carry out the practice for verification purposes. Activities, the other is to design relevant experiments according to students' interests, to help students deepen their understanding of physical principles and ideas, and to enhance their ability to innovate and practice. Take the measurement experiment of small bulb volt-ampere characteristic curve as an example, when designing related experiments, Students should first search the required data on the Internet, go to the laboratory, understand the experimental instruments and methods of use, determine the measurement object, and derive the calculation formula. Secondly, according to the experimental principle, select the measuring instrument to complete the small bulb. The task of measuring the circuit corresponding to the An Curve; finally, verifying the physical formula[3]. Practice has proved that only the theory andPractice of combining teaching, at the same time to strengthen students' creative thinking and practical ability to lay a good foundation for the comprehensive development goals.

3.5 Strengthening the Innovative Ability of Students

Innovative ability is also one of the main directions for the development of contemporary college students. The prerequisite for cultivating students' innovative ability is to choose the correct teaching method. When designing teaching problems, teachers should consider various factors to ensure students' thinking ability. Get a real workout in the process of thinking and answering questions. Physics methods are often hidden in knowledge and have a decisive role in acquiring and applying knowledge. This requires teachers to carefully analyze the materials to ensure that the skills and methods emphasized in any chapter of the textbook are fully available in the classroom. reflect. For example, when teaching the essence of light, teachers can emphasize the role of "hypothesis" and describe the process of Newton's conclusion: Newton believes that the essence of light is "the analogy of light and high-speed particle flow" because of the high speed. The characteristics of particle flow are mainly reflected in reflection, space motion, etc., which is very similar to the characteristics of light. Therefore, Newton believes that light is very likely to be particle flow. To make students clear, physics is a discipline that needs to make assumptions and verify hypotheses. Only in this way can we consciously strengthen our innovative ability and truly

develop in the process of learning.

4. Conclusion

In summary, although the basic concepts and principles involved in university physics will not change in the short term, it is necessary to optimize teaching methods and priorities. This is because only talents are based on different eras. The demand and adjustment of the teaching model can make the positive effect of university physics teaching on student development fully exerted. I hope that the content discussed above can inspire teachers in some aspects.

References

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