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Research on Effective Teaching of College Physics Courses for Chemistry Majors

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Abstract: The purpose of this study is to explore the learning effects of chemistry majors in college physics courses and how to achieve effective teaching. Through literature research and empirical investigation, this study found that students majoring in chemistry have many learning difficulties in college physics courses, such as inadequate mathematical foundation and poor understanding of physical concepts. In teaching, we should pay attention to the following aspects: first, improve students' mathematical literacy in order to better understand physical concepts; the second is to use case teaching and other teaching methods to stimulate students' learning interest and participation; the third is to strengthen experimental teaching and let students experience physical principles. The results of this study can provide reference and reference for the teaching of college physics courses of chemistry majors.

1. Introduction

As an important basic course, college physics for chemistry majors plays an irreplaceable role for students in the process of learning and researching chemistry. However, due to its strong theoretical, abstract, large amount of calculation and other characteristics, students generally feel difficult and the learning effect is not ideal. Therefore, it is of great significance to explore an effective teaching method and improve students' learning interest and learning effect for the teaching reform and improvement of teaching quality of college physics courses for chemical majors. In recent years, with the rapid development of information technology and the reform of higher education, various new teaching models and teaching methods have emerged in endlessly, including many effective teaching methods for college physics courses of chemistry majors. For example, the use of case teaching, inquiry teaching, interactive teaching and other teaching modes, as well as the introduction of multimedia technology, virtual experiment, online learning and other teaching methods, can effectively improve students' learning interest and learning effect[1-3].

However, due to the particularity of college physics courses for chemistry majors, what kind of teaching methods can be used to achieve effective teaching effect still needs further research and exploration. Therefore, the purpose of this paper is to carry out in-depth research on the effective teaching of college physics courses for chemistry majors, explore an effective teaching method suitable for this course, improve students' learning interest and learning effect, and lay a foundation for the teaching reform and improvement of teaching quality of college physics courses for

chemistry majors.

2. Characteristics and problems of college physics courses for chemistry majors

College physics course of chemistry specialty is a basic course of chemistry specialty. Its main purpose is to provide students with basic knowledge of physics in order to better understand and apply chemistry knowledge. However, compared with other majors, chemical majors often face some special problems and challenges when learning physics courses. First of all, because students majoring in chemistry have a relatively weak foundation in physics, they will encounter greater difficulties in learning physics courses. They need to master many abstract physical concepts, complex calculation methods and experimental techniques, which requires them to have strong mathematical, logical thinking and experimental skills, which often need to have laid a good foundation in high school [4].

Secondly, the teaching content of college physics course is more, and involves a wide range. Students need to master more knowledge points, which also brings teachers a lot of teaching difficulties. Teachers need to organize physical knowledge organically through rigorous teaching plans and flexible teaching methods, so that students can master the basic concepts, theories and experimental skills of physics [5].

In addition, students majoring in chemistry usually have a low correlation between their future work and physics knowledge, which will also lead to their low interest in learning physics courses and lack of learning motivation. Therefore, teachers need to adopt some interesting and vivid teaching methods to stimulate students' learning interest and enhance their learning motivation.

To sum up, the characteristics and problems of college physics courses for chemistry majors mainly include students' relatively weak learning foundation, more teaching content and low interest in learning. To solve these problems, teachers need to help students overcome difficulties and improve learning effects through scientific teaching design and innovative teaching methods.

3. Exploration of effective teaching methods

College physics for chemistry majors is a basic course, which has an important impact on students' learning and future career development. In this course, teachers need to master effective teaching methods to help students better understand and master physical knowledge. Here are some effective teaching methods [6].

(1) Establish basic knowledge

Before starting teaching, teachers should establish students' understanding of basic physics knowledge. This can be achieved through discussion and questioning to ensure that students have mastered the necessary knowledge, such as Newton's law, work and energy.

(2) Emphasis on experiment and application

Physics is an experimental science, so experiments and applications should be emphasized. Teachers can help students better understand and apply physics knowledge through laboratory demonstrations, experimental reports and case studies.

(3) Use visualization tools

There are many abstract concepts in college physics courses for chemistry majors, so using visualization tools can help students better understand and remember. This can be achieved by using tools such as animation, presentation, video, etc.

(4) Cultivate students' thinking ability

Physics is a subject that needs thinking ability. Teachers should cultivate students' thinking ability through questioning and discussion, and help them understand and solve physical problems.

(5) Provide feedback and evaluation

Teachers should provide timely feedback and evaluation to help students understand their learning progress and areas for improvement. This can be achieved through classroom tests, group discussions and assignments.

To sum up, the effective teaching methods of college physics courses for chemistry majors should include establishing basic knowledge, emphasizing experiment and application, using visual tools, cultivating students' thinking ability, and providing feedback and evaluation. The specific implementation methods can be one or more of case teaching, inquiry teaching, interactive teaching, multimedia technology, virtual experiment and online learning. These methods can help students better understand and master physics knowledge, thus improving their academic performance and future career development.

4. Effective teaching practice of college physics courses for chemistry majors

In order to improve the teaching quality of college physics courses for chemical majors, some effective teaching methods need to be adopted. The following are some practical methods that can help teachers better teach college physics courses for chemistry majors.

(1) Build interest

In order to make students interested in physics courses, teachers can attract students' attention by introducing interesting experiments or cases. For example, students can experience learning pleasure in practice and stimulate their interest in physics by showing experiments or cases related to chemistry [7].

(2) Practical teaching

The teaching of physics courses needs to combine practice with theory, so teachers need to make full use of laboratory resources to let students learn theoretical knowledge in practice. Through the experiment, students can better understand the physical phenomena, master the operational skills of physical experiments, and better grasp the physical knowledge [8].

(3) Guided learning

In the teaching process, teachers should pay attention to guiding students to learn and think actively. It can stimulate students' thinking, let students master knowledge in inquiry, and improve their learning effect by raising questions, discussing, and group cooperation.

(4) Value practicality

The knowledge of college physics courses for chemistry majors should be practical. Teachers need to introduce the application of physical knowledge to students in real life, so that students can understand the practical value of physical knowledge, so as to better grasp the knowledge.

(5) Evaluation feedback

In the teaching process, teachers need to evaluate and feedback students' learning in time, so that students can understand their learning situation, correct mistakes in time, and improve learning efficiency. At the same time, teachers can also understand the deficiencies in the teaching process through the feedback of students, and improve the teaching methods and contents in time [9].

To sum up, the effective teaching of college physics courses for chemistry majors needs to establish interest, practice teaching, guide learning, pay attention to practicality and evaluation feedback. Only through these effective teaching methods can we better improve the learning effect of students and improve the teaching quality of college physics courses for chemical majors.

5. Thoughts on effective teaching of college physics courses for chemical majors

The college physics course of chemistry specialty is one of the important courses of college chemistry specialty, involving the physics knowledge in chemistry. In the teaching process, how to effectively teach college physics courses for chemical majors is a problem that needs to be

considered. The following are some thinking points that can help teachers better carry out effective teaching of college physics courses for chemical majors [10].

(1) Teaching objectives

Before the teaching of college physics courses for chemistry majors, teachers need to determine the teaching objectives and clarify the knowledge and abilities that students need to master. By formulating reasonable teaching objectives, we can better guide the teaching process and improve the teaching effect.

(2) Teaching methods

The teaching methods of college physics courses for chemistry majors need to be diversified, combining theory and practice, so that students can better grasp knowledge. Teachers can use a variety of teaching methods such as lectures, experiments, case studies, group discussions, etc. to stimulate students' interest and improve their learning effects.

(3) Establish contact

The physical knowledge in college physics courses of chemistry majors needs to be connected with chemical knowledge. Teachers need to emphasize this connection in the teaching process so that students can better understand and master knowledge. Only by establishing connections can students' learning effect be better improved.

(4) Practical teaching

The practical teaching of college physics courses for chemistry majors is very important. Through laboratory practice, students can better understand and master physical knowledge. Teachers need to pay attention to practical teaching, guide students to think in the experiment, and improve students' experimental operation ability and theoretical knowledge level.

(5) Evaluation feedback

In the teaching process, teachers need to evaluate and feedback students' learning in time, so that students can understand their learning situation, correct mistakes in time, and improve learning efficiency. At the same time, teachers can also understand the deficiencies in the teaching process through the feedback of students, and improve the teaching methods and contents in time.

To sum up, the effective teaching of college physics courses for chemistry majors requires teachers to formulate reasonable teaching objectives, adopt diversified teaching methods, establish links, pay attention to practical teaching, and timely evaluate and feedback. Only through these effective teaching methods can we better improve the learning effect of students and improve the teaching quality of college physics courses for chemical majors.

6. Conclusion

With the development of society and the progress of science and technology, the teaching of college physics courses for chemical majors is also facing more and more challenges and opportunities. This paper summarizes and analyzes the effective teaching research in this field and summarizes the following points: First, according to the characteristics and needs of students majoring in chemistry, carrying out personalized and diversified teaching methods, such as experimental teaching, case teaching, interactive teaching, etc., can improve students' learning interest and learning effect. Secondly, we should pay attention to the quality of curriculum content and the innovation of teaching methods. In the course design and teaching practice, we should pay attention to cultivating students' experimental ability and problem-solving ability, and improve the teaching effect and quality with the help of modern teaching methods, such as virtual experiment and multimedia teaching. Finally, pay attention to evaluation and feedback, and adjust teaching strategies and methods in time. Teachers should guide students to conduct self-evaluation and reflection, provide timely feedback and suggestions, and constantly improve and improve teaching

methods and strategies to improve teaching effect and quality.

In the future, the research on effective teaching of college physics courses for chemical majors will continue to develop in depth. The following aspects are worthy of attention: First, with the continuous development of information technology, how to make better use of information technology to improve the teaching effect and quality will become an important direction of teaching research. Secondly, how to face the different needs of different students and develop personalized teaching methods and curriculum design will also become the focus of future teaching research. Finally, teachers' teaching ability and quality are also important directions of future teaching research. How to improve teachers' teaching ability and quality and improve teaching effect and quality is also an important topic for future teaching research.

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