Research on the Teaching Reform of College Physics under the Training Model of Applied Talent

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Abstract: In recent years, China has paid more and more attention to education. As a major place for talent training in China, many universities have formulated talent training programs to better cultivate talents. Social needs affect colleges and universities to a large extent. College physics is a course that students majoring in science and engineering need to take. The learning effect of college physics will also affect the learning of other courses to a certain extent. All colleges and universities need to pay attention to the teaching of college physics. This paper mainly explores the teaching reform of physics curriculum in colleges.

In recent years, China has made great progress in social development, and more and more emerging industries has developed, which makes the society's demand for talents gradually presents a trend of diversification. And the talent training mode of colleges and universities is gradually transformed into the training mode of applied talent. One of the basic courses in colleges and universities is college physics. Combining the training model of applied talent with college physics teaching can effectively enhance students' innovative ability and practical ability.

1. The Current Shortcomings of College Physics

1.1 Physics Teaching is not Valued

The training model of applied talent is mainly to train talents in line with social development and economic construction. Since the undergraduate syllabus has been revised, undergraduate colleges have paid more attention to practical teaching, which has reduced the hours of physics courses, resulting in the fault of the theoretical system of college physics, and the smooth connection between knowledge points. Some students find that the physics course is not important when they find that the class time of college physics is significantly less than other courses, which makes students pay less attention to physics learning and leads to students' unwillingness to actively learn physics knowledge.

1.2 Teaching Content is Backward

College physics teaching is carried out based on high school physics and continues to teach in-depth knowledge of optics, mechanics, electromagnetics, and heat [1]. Some of the physical concepts and theorems in these chapters are already available when students learn physics in high school, which has led to more students losing their passion for college physics. At the same time, in recent years, the employment situation of college students in China has become more and more severe. Most students will focus more on employment-friendly courses while they are at school. Students will actively obtain various certificates, and even they will be keen to invest in various social internships, associations and part-time activities, so that students are not willing to spend too much time in physical learning.

1.3 The Teaching Method is Relatively Simple

Because of the strong logicality and scientificalness of physics, students tend to have a serious impression on physics teachers. Most students are not willing to communicate with teachers, which leads to the failure of physics teachers to understand students' ideas in time. At the same time,

because most of teachers are using the traditional indoctrination teaching method, it is easy for students to feel that physics learning is boring, so that students are not willing to focus on physics learning.

2. Methods for the Teaching Reform of College Physics

2.1 Scientific Creation of Hierarchical and Modular Curriculum System

College physics is one of the basic subjects for college students to learn. Students of different majors have different degrees of mastering physical knowledge. In order to make the needs of different majors for physical knowledge consistent with the actual teaching knowledge, colleges and universities can create a scientific hierarchical modular course system, and reasonably arrange the hours of physics courses of different majors. In the actual teaching process of college physics, teachers can divide the course into two different levels and arrange different teaching time for two different levels of physics courses. They need to combine the teaching content with the professional needs to choose more useful teaching content for students. At the same time, teachers also need to formulate the teaching syllabus according to the level, so that the connection between students' professional course learning and physics learning can be further strengthened, and students' enthusiasm for learning can be fully aroused, and students can actively learn physics knowledge. In addition, in the actual teaching process, teachers also need to divide the physical teaching content into different modules according to the actual needs of students' majors, so that the teaching activities can be carried out smoothly. Science and engineering majors include mechanical, electrical, automation and materials. Students of different majors and grades need to learn different physical knowledge. Therefore, teachers need to choose teaching content reasonably. For example, for students of the same grade, teachers can teach thermodynamics to students majoring in materials and optics and mechanics to students majoring in transmission lines. The hierarchical and modular curriculum system can effectively meet the physical learning needs of students of different majors [3], making students willing to actively learn physical knowledge.

2.2 The Assistance of Effective Measures to Improve Students' Interest in Learning

That whether students are interested in college physics affects students' initiative in learning to a great extent. Teachers can use a variety of effective measures to improve students' interest in classroom physics learning. In the process of physics teaching, teachers can use life examples to introduce physics concepts to enhance the attraction of physics learning and enable students to actively learn physics knowledge [4]. For example, when teaching the law of conservation of kinetic energy, teachers can make full use of multimedia technology. They can play diving video to students, then put forward physical problems, and actively guide students to think about the conservation of kinetic energy. For example, when teachers teach the knowledge of optics, they can remind students of 3D glasses, which can lead into the teaching of polarization knowledge of light.

Physics teachers can also use experiments to carry out teaching. Physics experiments can not only fully mobilize students' learning interests, but also enable students to actively participate in physics experiments, which promotes students' practical ability. For example, when explaining static knowledge, teachers can first demonstrate the effect of electrostatic shielding in the classroom. The teacher requires students to observe the physical phenomena generated in the demonstration to further enhance students' understanding of static electricity. In addition, teachers need to interact with students as much as possible in the process of experimental teaching, and actively guide students to think about the causes of physical phenomena [5]. An important goal of applied talent training is to enhance students' practical ability, and experimental teaching can just allow students to experience more hands-on practice, and promote students' practical ability.

2.3 Teaching with Digital Technology

The continuous advancement of science and technology in recent years has promoted changes in social life. At the same time, advances in science and technology have also promoted changes in

teaching methods. Teachers can use multimedia courseware to teach physics in the actual teaching process, and use multimedia courseware to allow students to have a more intuitive understanding of the charm of physics. At present, many colleges and universities in China have installed projectors in classrooms, which can provide many conveniences for physics teaching activities. And teachers can also use electronic devices such as mobile phones and computers for teaching management. They can use the APP to name rolls, which can effectively reduce the time required for physics teachers to roll in the classroom. At the same time, physics teachers can also arrange learning tasks on the APP, and students can use the APP to complete learning tasks before the class, so that students can preview physics knowledge before class. Besides, teachers can also use digital resources such as animations and video materials to carry out teaching, so that students can understand physics knowledge points well. If universities have rich physics teaching resources, teachers can also make full use of the simulated physics experiment system to carry out simulation experiments in classroom teaching [6], so that students can feel physical phenomena more intuitively. Because physics courses have limited hours, teachers need to make the most of their teaching time. At the same time, universities can also scientifically create a digital teaching platform for physics, so that students can obtain physics learning resources at the first time. Physics teachers need to teach students to use the network platform and use the learning resources published on the network platform in a targeted manner [7]. Physics teachers can also create class groups, students can ask learning questions in class groups, and teachers can analyze the answers to questions with students in class groups. The application of digital technology in college physics teaching can enable students to achieve better results in physics learning.

2.4 Implementation of Task-oriented Group Teaching

In the past, most of the physics classes used indoctrinated classroom teaching [8], and the students' main position in the classroom could not be reflected. Therefore, the physics teachers could use the task-oriented group teaching method to further improve students' initiative in physics learning. In the process of classroom teaching, teachers can divide the students into several groups, and assign learning tasks to each group. The group is required to preview and discuss before class according to the learning tasks. The students can put forward their own learning questions in the group, and then discuss the solutions together. If the group members are unable to solve the problems, they should promptly ask teachers for help, so that the physical problems can be solved in time. At the same time, the teacher can choose a representative from each group to share the results of the group discussion, and the groups can also evaluate each other, so that each group can know their own shortcomings and students can make continuous progress. Task-oriented group teaching can effectively improve students' main position in the classroom, promote students' initiative in physics learning, and achieve better physical teaching results.

3. Conclusion

In modern society, applied talents are needed. Under the background of applied talents training, it needs teachers to use such methods as hierarchical and modular curriculum system and digital technology and task-oriented group teaching to carry out teaching, so as to fully mobilize students' interest in learning physics knowledge, enable students to master more physical knowledge, and promote the effect of college physics teaching.

Acknowledgements

Teaching reform project of Nanhang Jincheng College: reform and practice of college physics cu rriculum system

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