Research on Physics Experimental Teaching in Colleges and Universities Guided by Core Literacy

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Abstract: With the continuous change of curriculum reform, the teaching of physics experimental research in colleges and universities is becoming more and more important, and the practice teaching guided by core accomplishment is an important part of it, which is helpful to improve the students'ability of hands-on operation and understanding, and to improve the students'positive and rigorous attitude in physics learning in an all-round way. Therefore, teachers should pay strict attention to the core literacy-oriented practical research methods in physics teaching. This paper will expound the connotation of core literacy, the significance of physical experiment teaching in colleges and universities and the present situation of experimental teaching research in colleges and universities guided by core literacy, and provide constructive measures for experimental teaching in colleges and universities guided by core literacy.

1. The Connotation of Core Literacy

Core literacy-oriented physics learning refers to the necessary qualities and key abilities formed by students in the process of learning physics, including not only the various abilities embodied by students in learning, but also the attitude of students towards learning. Experiment is the only way to study physics, and it is also the most effective way to improve the core accomplishment. Through experiment, it can strengthen the practical operation ability of college students, help students to sum up their experience, and deeply grasp the core accomplishment of physics concept, physical practice, thinking ability and learning attitude.

2. The Significance of Physical Experiment Teaching in Colleges and Universities

Because of the influence of traditional teaching, the "teacher-centered" teaching method is still used in the physics classroom in colleges and universities, and the students become the learning machine, which leads to the students losing their original interest in the theoretical teaching of the classroom and even the disgusting attitude towards the subject of physics. In fact, in today's society, what is more needed is practical talents, so starting from the classroom in colleges and universities, it is important for teachers to do practical research. Through the development of experimental teaching, students can consciously become the master of learning and participate in learning independently, which cannot only stimulate students'enthusiasm for physics learning, but also train students'professional skills in physics, and strive to train practical physics talents for the country [1].

3. The Research Status of Experimental Teaching in Colleges and Universities Guided by Core Literacy

Core literacy is not only the requirement of students'learning ability but also the requirement of learning attitude. But the core accomplishment is not born to the students, but is formed by the gradual accumulation of the students through the acquired learning. The core literacy-oriented experimental teaching research in colleges and universities requires students to continue to sum up their experience in the experimental process, work hard to improve their learning ability in all aspects. However, in the process of cultivating core literacy, colleges and universities still face

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various problems. After entering the school, college students become loose, irregular, irregular life, and have no clear learning goals, which leads them to lose enthusiasm for learning and cannot devote themselves to physical experimental research.

The most important thing in physics experimental research is still to put into practice, because of the various reasons of the learning environment in colleges and universities, many students still cannot take the initiative to participate in extracurricular autonomous learning on the basis of providing a lot of conveniences in the school, so it is difficult to connect with the actual life. The lack of equipment in colleges and universities is also one of the problems, because of the excessive number of people in the classroom, it is difficult to ensure that every student can get practical opportunities in the course of class. And in the case of limited classroom time, teachers cannot take care of all students, let all students get guidance, which leads to the lack of students'core literacy. In the face of all kinds of resistance in the research of physics experiment teaching in colleges and universities, we should give full play to the subjective initiative and actively devote ourselves to the improvement of physics experiment teaching.

4. Research Measures of Experimental Teaching in Colleges and Universities Guided by Core Literacy

4.1. Adoption of the Modalities of Group Cooperation

According to the number of class members, the class members can be divided into groups such as A, B and C according to the rank of class. As shown in (Figure 1) and (Figure 2), the group members can select a student with strong organizational ability, learning ability and various qualities as the group leader to communicate directly with the teacher and help the other members of the group to learn. And can implement the system of points, let each group form a competitive relationship, because the appropriate competition can greatly stimulate the enthusiasm of students to participate, for the class to create a good learning atmosphere.

Figure 1 Grouping

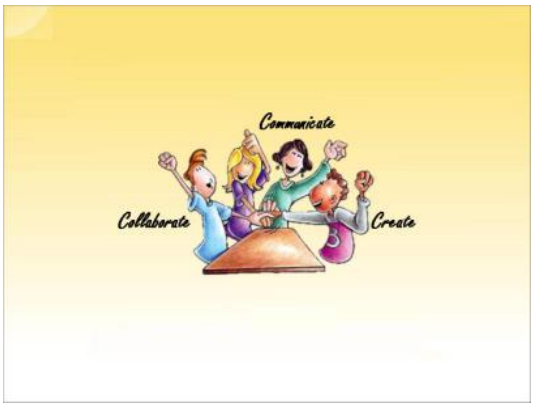

Figure 2 Grouping

There are many members in the class, so the learning ability of each other is different, in this case, according to the comprehensive effect of learning ability, practical ability and cooperation ability, the group can be divided into three levels, and finally, the students in the class are divided

into three levels: primary, intermediate and senior, which is the difficulty group, while intermediate is the intermediate group member between the two.

This kind of cooperative teaching cannot only reduce the burden of teachers, but also strengthen the cohesion of students, make students more closely connected, gain novelty under the new teaching methods, and then actively devote themselves to learning, enhance the learning ability in physics, and finally realize the improvement of the core accomplishment of physics experiment teaching.[2].

4.2. Links to Real Life

The study of physics is closely related to our life, but the traditional teaching method is mainly theoretical, physics teachers do not bring the actual life into the teaching, gradually let the students lose interest in physics learning. In later teaching, physics teachers can focus on bringing physics into the students'real life, so that they can better understand the real use of physics in life. For example, in the experiment "Measuring Length Using Spiral Micrometers and Vernier Calipers "(shown in Figure 3 and Figure 4), teachers can assign their homework to each group and let students use what they have learned to measure the practical things in their lives, so that students can understand the close connection between physics and life, thus arousing their interest in learning physics and seriously put into the process of practice.

Using the physics knowledge to solve the problems in life, this is the most prominent place for physical learning ability to show. Encourage students to explore physics in life, help to improve the efficiency of physics learning, can continue to accumulate experience in life, so as to improve the ability to learn physics, let students understand that life is full of physics, physics can also help us live.

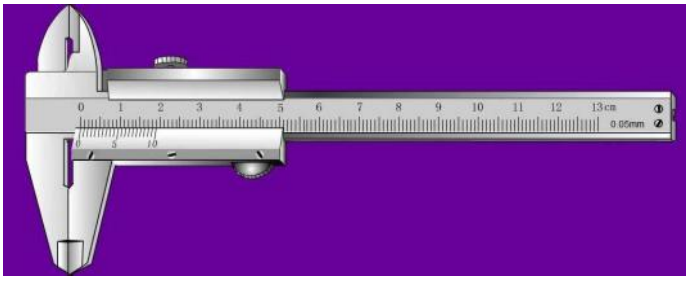

Figure 3 Vernier calipers

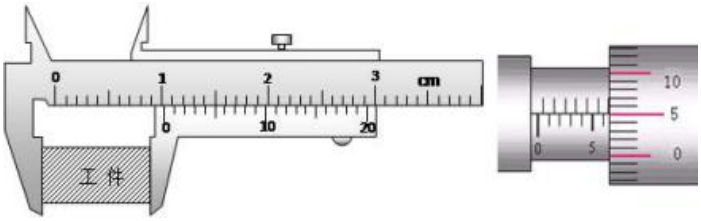

Figure 4 Measurements

4.3. Using "Internet +" for Physics Teaching

Nowadays, the internet is becoming more and more rapid, and gradually introduced into the teaching, most colleges and universities use multimedia teaching, using a variety of technology to carry out practical teaching, of course, physics teaching is not without it.

Physics teachers can use the way of video teaching to record practical operation video for students, and let students in class according to the video content, skilled operation of practical steps. Through this way, students can clearly understand the operation of each step, and let the learning have controllable, targeted. In order to improve the students'learning autonomy, the teacher can arrange the corresponding homework on the basis of the video, and let the students have their own access to the data. In the pre-class physics teachers can leave some time to select individual students to show their own learning effect, thus stimulating students'autonomous learning ability.

4.4. Utilization of School Physics Teaching Resources

The physical teaching resources in colleges and universities are relatively perfect compared with the middle and high school period. In the case of abundant physical teaching resources, it is necessary for teachers to make rational use of them, so that students'practical and operational ability can be effectively brought into play, not just stick to theoretical courses. Physics teachers can carry out practical investigation in the form of group cooperation in practical teaching, which cannot only strengthen the group communication, but also improve the group practice ability of the members of the group, and constantly develop the students'thinking creation ability.

Teachers can start new teaching projects, actively guide students to participate in it, make the boring classroom active, and be able to make full use of the students'time after class. For example, in the teaching of "studying the motion of flat objects "(as shown in figure 5 and figure 6), the teacher can organize the discussion of each group, let the group cooperate to complete the research content, and present the practice process, the division of labor and the result of practice in the form of a report, and the students will participate in the new class to explore the practical results together. Under the equipment provided by the school, the students can give full play to their various abilities, participate in the practical operation, and carry out their own work part according to the division of labor. And teachers as a guide, in the case of students in doubt, with the help of Internet communication platform to keep in touch with the students at all times, to solve all the problems of students in real time, to ensure the smooth completion of the time task. Through each actual performance research activities, constantly exercise students'learning ability, let students correct their learning attitude, and cultivate students'core accomplishment in physics learning [3].

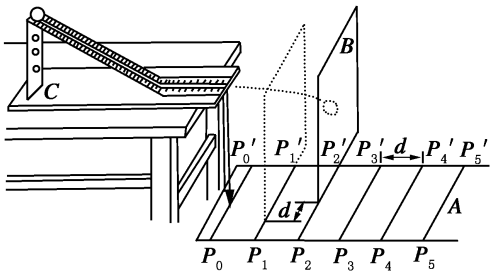

Figure 5 Study on the motion of a flat object

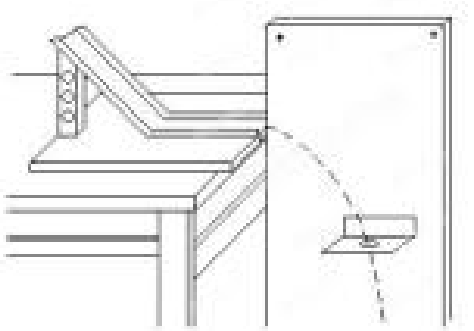

Figure 6 Study on the motion of a flat object

5. Conclusion

In short, the core literacy-oriented college physics experiment teaching It is the focus of attention of the school, starting from the students'learning attitude, learning ability, learning practice and other aspects of my core literacy, focusing on the cultivation of practical talent, the school should actively guide students to participate in physical experimental research, let students become the master of learning, so as to improve their comprehensive literacy, and strive to become the pillars of the country.

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