Physics Education Promotes the Cultivation of College Students' Scientific Quality and Innovation Ability

Xinxin Wan

College of Physics and Electronic Information, Inner Mongolia Normal University, Hohhot Inner Mongolia, 010022, China

wanxinxin-0814@163.com

Keywords: Scientific Quality, Innovative Ability, College Students, Physics Education.

Abstract: Physics education is an important course, with the continuous change of curriculum reform, college physics education becomes more and more important, and the practice teaching training oriented to college students' scientific quality and innovation ability is an important part of it. Strengthening the cultivation of college students' innovation ability is helpful to improve students' practical operation ability and understanding ability, and improve students' positive and rigorous attitude in physics learning in an all-round way. This paper will highlight the cultivation of college students'comprehensive ability in physics teaching from the beginning of scientific quality and innovative practical ability.

1. The Connotation of Scientific Quality

Scientific quality is the quality of human being as a subject to respect science, study science, develop science, apply the spirit, attitude, method, knowledge and ability of science, and is an important part of human subjectivity. Scientific quality is not equal to scientific knowledge, scientific knowledge is not equal to book knowledge, book knowledge is not equal to textbook knowledge. Exploring and developing science through critical thinking and positive practice, including revising imperfect theory, overthrowing unscientific theory and refining new scientific theory in practice, is the core of scientific quality.

Scientific quality is one of the index of human development, so improving scientific quality is the systematic engineering of national quality, training critical thinking mode should be the basic course in the basic course of college students ," trusting the book is not as good as no book "should be the first class of college students, and having originality for pride and no originality should become the basic values of college students.Science-oriented physical education refers to the necessary qualities and key abilities of students in the process of learning physics, including not only the abilities embodied by students in their study, but also the attitude of students towards learning. College students should be able to learn physics from the basic grasp to improve their own ability, strengthen communication and communication with people, college students should have a good scientific spirit, have the spirit of hard work and scientific research, and be able to fully apply scientific knowledge in physical experiments[1].

2. Innovative Practical Capabilities

Because of the influence of the traditional teaching, the teaching method of "teacher-centered" is still used in the physics class of colleges and universities, the students are in passive learning and lack of subjective initiative, so the students lose their original interest in the theoretical teaching of the classroom, because the physics course is more cumbersome, they need to know more and have more theoretical knowledge, so many students lose their ability to learn physics under the original education mode. And cultivating students' innovative practical ability can help students to practice on the basis of theoretical courses, and assemble some objects by doing it themselves. This form can not only improve students' interest in learning, but also improve students' thinking ability and solve some problems creatively. In fact, in today's society, more practical talent is needed, so

  DOI: 10.25236/acaelt.2020.036

starting from the university classroom, teachers do practical research is the important point of physics learning, through the development of experimental teaching, students can consciously become the master of learning, independent participation in learning, so that not only can stimulate the enthusiasm of students to learn physics, but also can train students in physics professional skills, and strive to cultivate practical physics talents for the country.

3. The Present Situation of College Students' Physics Education

Physics education for college students, different from the pressure of junior high school students, college physics is more through theoretical knowledge to enhance hands-on ability, strengthen physical experiments, have the spirit of scientific research, so this is not only the requirements for students to learn ability but also the requirements of learning attitude. However, students' scientific quality and innovative ability are not born by students, but are formed by students slowly accumulating through acquired learning. College students' physics teaching based on scientific quality requires students to constantly accumulate and sum up in their study and practice in peacetime to improve their learning ability in all aspects. However, in the process of cultivating students' scientific quality and innovation ability, universities still face various problems, and many students become loose, undisciplined, irregular life and have no definite learning goals after entering the university, which leads them to lose enthusiasm for learning and can not devote themselves to physical experimental research.[2].

In today's society, there are many kinds of problems in the process of development. These problems are very complex, which require students to have many abilities, such as humanities and natural science, so college physics education has an irreplaceable effect on the cultivation of students' scientific quality and innovation ability. which leads to the lack of students' innovative practical ability. In the face of all kinds of resistance in the research of college physics practice teaching, we should give full play to the subjective initiative and actively devote ourselves to the improvement of physics practice teaching.

4. The Cultivation of College Students'Science Quality and Innovation Ability in Physics Education

4.1. Through Group Cooperation

Break the traditional teaching mode, through the form of group cooperation to carry out the teaching, according to the students' interest in the subject research, the group members can make suggestions through their own understanding of the physical practice, the group members talk about the research, communicate the final results with the teacher, carry on the hands-on operation under the condition of safety, carry on the real-time update adjustment, combine the constructive task of the curriculum with the cultivation of the scientific quality and innovation ability of the college students, and can implement the integral system to form the competitive relationship between each group, and the appropriate competition can greatly stimulate the students to participate in the positive, Create a good learning atmosphere for the whole class.(Figures 1,2)

Figure 1 Physical experiments

Figure 2 Physics laboratory

This kind of cooperative teaching can not 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, improve the learning ability in physics, and finally realize the improvement of innovation ability in physics practice teaching.[3].

4.2. Links With 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 physics into the teaching of real life, gradually let students lose interest in physics learning. In the later teaching, physics teachers can focus on connecting physics knowledge with students' real life, better understand physics knowledge and enhance their interest in learning physics.

Using the physics knowledge to solve the problems in life, this is the most prominent place for physical learning ability to show. Encouraging students to explore physics in life is conducive to improving the efficiency of physical learning, to be able to continuously accumulate experience in life, so as to improve the ability of various physical learning, and to obtain higher physical experience by creating household daily necessities.

4.3. Using the Internet+ to Carry Out 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. To Make Good Use of School Physics Teaching Resources

In college physics teaching resources are relatively perfect relative to the middle and high school, in the case of rich physics teaching resources, teachers need to make rational use of, so that students' practical operation ability can be effectively played, not just stick to the theoretical curriculum. Open science and technology physics courses, guide students to keep up with the pace of the times, and provide a higher scientific research foundation for students to learn.

4.5. Building an Open Platform for Practice

Teachers can start new teaching projects, actively guide students to participate in it, make the boring classroom active, and make full use of the students' time after class, improve the teaching and practicality of college students' physical practice, integrate the relevant teaching resources, teachers can organize various groups to discuss, let the group cooperate to complete the research content, and present the practice process, group division of labor and practice results in the form of a report. 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 this form to attract more physics enthusiasts to join in, get more gains, through each performance research activities, constantly exercise students' learning ability, let students correct learning attitude, cultivate students in physics learning scientific quality and innovative practice.

5. Conclusion

To sum up, college physics practice teaching with scientific quality and innovative ability as the core is the focus of attention of the school, starting from the students' learning attitude, learning ability, learning practice and other aspects to train comprehensive talents, from multiple perspectives to recognize the function of physical practice.

Acknowledgements

This research has been financed by The Teaching Research Project of Inner Mongolia Normal University in 2017 (178jxyj065)

The Full-semester Education Practice Teaching Research Project of Inner Mongolia Normal University in 2019 (qjs201917)

References

[1] Liu, Yan. Physics education promotes the cultivation of college students' scientific quality and innovative ability. Farm staff, no. 22, 2019.

[2] Wen, Yaqin., Liu, Yanfen., Xin, Jiangbo. Physics education to promote the cultivation of college students' scientific quality and innovative ability. Heilongjiang Science, vol, 9. No, 130-15, pp. 31-32, 2018.

[3] Huang, Xi. On the Status and Role of Physics Education in Cultivating College Students'Science Quality. New Age of Education (Electronic Journal)(6 issues), pp. 36-36, 2018.