Pisco Med Publishing

Original ResearchArticle

Discussion on experimental teaching and cultivation of innovation ability

Shuwen Wang

Lingnan Normal University, Guangdong, China, 524048

Abstract: With the continuous progress of the society, China's demand for comprehensive high-quality talents is also increasing, so the reform and optimization of the new curriculum is an inevitable trend. The society has higher and higher requirements for experimental teaching. Because there are still many problems in experimental teaching, these problems also restrict the great cause of education in our country, so that students can't really receive better education. Therefore, this paper will further analyze the problems existing in the experimental teaching, and put forward some targeted experimental teaching and innovative ability cultivation strategies, in order to improve the teaching quality and students' comprehensive quality ability in China.

Keywords: Experiment; teaching; ability to innovate; cultivate

1. Introduction

Because the experimental course is a subject that students must learn, and its proportion of the score value is relatively large, so teachers and students should pay great attention to it. The implementation of the experimental teaching method into the experimental teaching has a good teaching effect, because it can not only better consolidate students' theoretical knowledge of the textbook, but also improve students' practical ability, and make students' innovative thinking have better exercise. Therefore, in order to ensure that the experimental teaching effect can be improved and students' innovative thinking can be developed more comprehensively, teachers must innovate experimental teaching methods.

2. Experimental teaching method and innovation strategy

2.1 Introduce multimedia teaching methods

Thanks to the rapid development of science and technology, multimedia teaching has been widely used in the experimental teaching of junior high school, and has achieved good results. As the knowledge in the textbook is abstract words and some simple pictures, students need to carefully read and then imagine, so it is very difficult for students to understand and grasp the knowledge. However, after the introduction of multimedia teaching method, teachers can play some videos of others doing experiments, which is conducive to students' direct observation and learning. At the same time, they can deepen their impression of the experimental operation process in this way, thus reducing students' mistakes in experiments as far as possible. The traditional teaching method is combined with today's multimedia teaching method, which can reproduce the experiment scene, supplement each other, and let students know more operation methods before the experiment. As shown in **Table 1**:

doi: 10.18282/le.v7i2.770

Innovation strategy
Introducing multimedia teaching
Emphasis on increasing student experience
Applying the teaching model of group cooperation
Design experiments scientifically

Table 1. Innovation strategy

2.2 Emphasis on increasing student experience

Junior middle school is the time when students are in their teenage years, which is also an important period to cultivate their practical ability and develop their intelligence. Therefore, teachers should pay more attention to students' learning characteristics and take different ways to guide them. During the experiment, because the students lack the experience, so they will choose to imitate the practice of teachers, so the teacher must show detailed preparation, actively encourage them to do on their own, and be patient to guide each student to do experiments, which can increase students' experience, at the same time improve the quality of experimental teaching.

2.3 Apply the teaching mode of group cooperation

In experimental teaching, teachers should not only cultivate students' individual ability, but also pay attention to cultivate their team spirit, which can be applied to the teaching model of group cooperation. In the face of students' questions, teachers should first encourage them to discuss with the team members, at the same time, they should give some necessary hints, and finally correct and supplement the answers of their team. This kind of teaching mode can make every student participate in the discussion, stimulate their interest in experimental subjects and consolidate the knowledge they have learned better, and cultivate their independent learning habits and spirit of continuous exploration.

2.4 Design experiments scientifically

Students have to study several independent subjects, so students learn how heavy the learning task is. Teachers should give full consideration to the actual situation of students when assigning homework after class, and then scientifically and reasonably design experimental homework, so as to achieve the essence and discard dregs. Moreover, the difficulty should be appropriate to ensure students to complete the task on their own, which can increase students' confidence to improve the learning efficiency.

3. Suggestions on developing students' innovation ability

3.1 Make full use of the learned knowledge system and common sense of life to experiment

In daily life, students often get some experience. Moreover, the teaching of knowledge content in experimental courses can also help students to guess and assume the phenomenon of new experimental content. For example, when learning "Joule's Law", it is necessary to analyze the understanding of electricity in daily life. Through the application of experimental knowledge, it is possible to conjecture and assume the influencing factors that lead to the generation of heat in conductors, so as to realize in-depth discussion on the subject of experimental content. As shown in **Figure 1**:

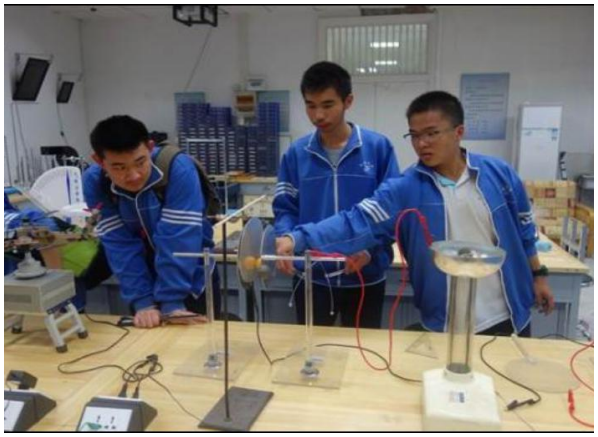

Figure 1. Electrification experiment of college students

Secondly, teachers can also introduce research questions based on the phenomenon of the heat generated by light bulbs used for a long time in students' lives and the heat generated by the electrification of the microwave oven, and ask students to think and communicate about the research based on this phenomenon, and make reasonable assumptions about the influencing factors.

3.2 Good at using analogy

The method of analogy can better materialize abstract things, so that the possibility of conjecture and hypothesis can be realized to a greater extent. Therefore, in the teaching process of experimental courses, teachers can introduce the familiar things to students and ask students to make analogies with the research objects, so as to guess and assume the unknown features of things on the basis of what they already know. For example, when learning “electric potential and electric potential energy”, due to the abstractness of its concept of electricity, it is difficult to prove whether the charge has energy in the electric field. Therefore, the teachers will need to guide students to gravitational potential energy and electric potential energy the analogy, so as to improve students' understanding of the work of electrostatic force, and then put forward the reasonable hypothesis.

4. Conclusion

To sum up, in order to better improve students' practical ability, schools should give students more experimental space, so that students' innovative thinking can be cultivated. Therefore, when teaching experimental courses, teachers should clarify students' subjectivity, let them give full play to their creativity for experimental innovation, so as to enhance students' enthusiasm to participate in experiments. At the same time, attention should be paid to cultivating students' innovation ability in the process of experimental teaching, so as to improve students' comprehensive quality and ability and better meet the subsequent employment needs.

Acknowledgement

Education and teaching reform project of Guangdong province: The reform and practice of the new model of "first-class course" for electrical information (387) (LSJGZH1903), Lingnan normal university teaching quality and teaching reform project.

References

1. Li F. How to train students' innovation ability in chemical analysis experiment teaching [J/OL]. Training in China: 1[2019-12-17]. https://doi.org/10.14149/j.cnki.ct.20170622.024.
2. Wu D, He Y, Huang GL, Jiang L. Cultivation of innovation ability of TCM students in experimental teaching of medical micro experiment [J/OL]. Journal of Southern Medical University: 1-2[2019-12-17]. http://kns.cnki.net/kcms/detail/44.1627.R.20180822.0929.040.html.
3. Qiao YC, Huang DL, Liu MC. An analysis on the reform of integrated design experiment teaching in micro-experiment science [J]. Acta Medicinae Sinica 2016; 27(01): 148-149.

4. Xi ZF, Wu XF, Zhou SW, Ou QL, Wu LH. Analysis on the new characteristics and safety management of experimental teaching center under the new situation [J]. Meitan Higher Education 2016; 32(04): 118-121.
5. Zhou LY, Pan WJ, Lin X, Chen MX, Chen JX. Discussion on the reform of chemical and pharmaceutical laboratory [J]. Guangzhou Chemical Industry 2016; 42(20): 239-240+242.
6. Sui XX, Shi JT. Research and analysis on fluid mechanics experiment teaching for cultivating innovative talents of petroleum engineering specialty [J]. Petroleum Education 2018; (03): 127-129.
7. Wang LJ, Liu LD, Zhang L. On the cultivation of scientific spirit and ability in the experiment teaching of genetics [J]. Adult Education in China 2016; (02): 126-127.
8. Lan SH, Luo HB, Wu XW, Wang YT. How to carry out professional comprehensive reform in local colleges and universities [J]. Shandong Chemical Industry 2017; 46(07): 173-176+178.