

Research on the Reform of Chemistry Teaching System Based on the Cultivation of Core Literacy of Chemistry Subject

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Abstract: College chemistry is a subject based on experiments, in which students can learn a lot of empirical knowledge that is not mentioned in textbooks. The core literacy of chemistry discipline is an important part of the concrete implementation of core literacy with the help of curriculum system, aiming at cultivating students' key literacy through chemistry courses and improving their problem-solving ability by using chemistry learning thinking. Core literacy focuses on promoting students' all-round development, so students are the main body of learning in the specific classroom education process. Teachers should change the traditional teaching mode and focus on cultivating students' core literacy. Only in this way can we cultivate all-round talents. This paper mainly analyzes the reform of chemistry teaching system based on the cultivation of core literacy of chemistry subject from the perspective of core literacy cultivation, so as to promote the actual effect of college chemistry classroom teaching and promote the continuous improvement of college students' core literacy of chemistry.

1. Introduction

With the implementation of the new curriculum standards, the reform of college education and teaching has been further deepened, and the teaching reform of chemistry course has been paid more and more attention. Under the new situation, there are still many problems to be solved in college chemistry teaching based on the core literacy of chemistry[1]. In the teaching process under the new situation, teachers should not only attach great importance to improving students' learning quality and academic performance, but also pay attention to cultivating students' core literacy[2].

In the process of teaching, college chemistry teachers should combine the contents of textbooks, deliver the contents related to core literacy to students, train students' independent thinking ability and innovation ability, and let students strengthen the consolidation of chemistry knowledge through cooperation and interaction, quickly grasp the main points of knowledge and improve teaching efficiency. This paper will analyze the current situation of college chemistry teaching, hoping to bring some reference value to related research activities.

2. Core Literacy of Chemistry Discipline

Core refers to the most important part. Literacy is a comprehensive quality that can be cultivated the day after tomorrow. Core literacy is the requirement for cultivating future talents in the 21st century, and having the most core and key abilities and qualities is the direction for cultivating talents at this stage[3-4]. The cultivation of core literacy does not stop at school, and social practice also plays an important role in the cultivation of core literacy. Under the concept of lifelong learning and lifelong development, the development and cultivation of core literacy should be accompanied for a long time.

The core literacy of chemistry is an important part of the concrete implementation of core literacy with the help of the curriculum system, aiming at cultivating students' key literacy through chemistry courses and improving their problem-solving ability by using the thinking of chemistry learning[5]. From this, we can see that students' core literacy in chemistry has developed from a low

level to a high level, and the core literacy in five dimensions has been emphasized according to different contents. In the content of Atomic Structure and Periodic Law of Elements, students' macroscopic identification and microscopic analysis, evidential reasoning and model cognition are mainly cultivated in the thinking level, students' scientific inquiry and innovation consciousness is cultivated in the practice level, and students' scientific attitude and social responsibility are cultivated in the value level.

3. Infiltrate the Value of Core Literacy in Chemistry Knowledge Teaching

The proposal of core literacy is formed on the basis of our deep understanding of educational laws at present, which will play a very important role in the development of quality education in China. Under the background of core literacy, college chemistry education pays more attention to students' all-round development, which is a change from simply cultivating knowledge and skills to promoting students' all-round development.

In the classroom teaching, teachers take thinking questions as the starting point to guide students to combine experimental phenomena and existing knowledge to start classroom discussions; In the after-class session, teachers bring classroom discussion and thinking questions into the scope of experimental assessment, and modify the experimental questions according to the classroom discussion[6].

The correct learning concept has a great influence on students. If students don't have positive and correct learning ideas, they will shrink back when they encounter difficulties and setbacks, so they will not actively explore teaching knowledge, thus they will not be able to improve their chemistry level and cultivate their core literacy in chemistry. In this way, students cannot become all-round talents useful to society.

Teachers need to introduce innovative teaching ideas in the teaching process, so that college students can have a more diversified learning environment, so as to cultivate their comprehensive quality to a certain extent and let students develop good thinking habits[7]. In the teaching process, teachers should also pay attention to the cultivation of students' cultural and moral qualities so that they can develop in an all-round way. Therefore, the cultivation of core literacy is of great significance to students' own development.

4. Reform Strategy of Chemistry Teaching System Based on the Cultivation of Core Literacy of Chemistry Subject

4.1 Carry out Cooperative Learning

In the new era of education with the continuous development of the new curriculum reform, the student-oriented educational concept prevails in the field of education, and the teaching method of cooperative learning is frequently used by teachers in the classroom, all of which are to reflect the students' subjectivity in the classroom, enable students to actively participate in the classroom, and help students acquire knowledge and skills efficiently.

Core literacy focuses on promoting students' all-round development, so students are the main body of learning in the specific classroom education process. In order to respect students' dominant position, teachers must improve educational means and methods in the process of teaching, so as to guide students' learning. On the premise of ensuring the training of basic knowledge and skills, the experimental content is combined with local economy, daily life, experimental competition, job skills and scientific research and development, so that the experimental content is cutting-edge and systematic[8].

Through cooperative learning, students are fully engaged in learning in a democratic and harmonious classroom atmosphere, and the core literacy of students in changing ideas and balancing thoughts is cultivated, which successfully improves the efficiency of students' chemistry learning and the teaching quality of college chemistry classroom.

4.2 Carry out Problem Situation Teaching

Developing situational teaching of college chemistry can guide students to think about teaching knowledge through situations and make them master teaching knowledge quickly. Situational teaching of chemistry focuses on chemical research carried out in different environments, which enables students to explore problems in a certain chemical environment in advance, and enables students to understand and analyze the problem in depth, so that they can better express their personal views in this atmosphere.

In the process of implementing core literacy teaching, teachers should pay attention to the key points and design questions according to the contents of specific chemistry textbooks. This process can help students develop the habit of exploring questions, guide students to think correctly, make their core literacy of chemistry develop greatly, and also improve the teaching effect and quality of chemistry classroom[9]. Introduce experimental teaching, and encourage experimental teachers to participate in the undergraduate research training program of our university, so that students with scientific research interests can participate in scientific research activities, and further enhance students' ability of independent thinking, operation and analysis through the interaction between teachers and students in specific scientific research projects.

4.3 Combination of Theory and Practice

In college chemistry classroom teaching, based on the higher requirements put forward by the new curriculum standard, combined with the optimization and innovation of teaching methods and technologies, theoretical chemistry knowledge analysis is combined with chemical experiment teaching, and students' ability of evidence reasoning and model cognition is cultivated and improved, so that students can learn to collect evidence, reason the correlation between different chemical knowledge, guide students to establish the logical relationship between evidence, reasoning and conclusion, and understand chemical knowledge or chemical phenomena with the help of models, so as to improve the teaching level of college chemistry classroom. Gradually cultivate students' rigorous scientific attitude and cultivate their awareness of advocating truth and exploring the unknown. At the same time, in class, teachers can also emphasize the contribution of chemistry to the world and let students know the importance of chemistry. In the process of question hypothesis, experimental design, experimental demonstration and exchange summary, students' learning impression can be deepened, and students can integrate their learned chemical theoretical knowledge with experimental activities. Guiding students' experimental inquiry can have an important influence on the formation of students' core literacy.

4.4 Adhere to Quality-Oriented Teaching

In experimental teaching, it is necessary not only to improve students' quality of chemistry, but also to cultivate students' correct world outlook, values and outlook on life, and to establish students' sense of social responsibility. For example, in the first concentrated explanation session of the experimental course, teachers explain cases about the authenticity and reliability of data, guide students to obtain real and effective data through experiments, and treat problems in experiments with a scientific attitude, thus cultivating students' good scientific awareness and rigorous scientific attitude, and laying a good foundation for cultivating innovative spirit and improving scientific literacy.

Teachers can infiltrate the cultivation of core literacy into the teaching of chemical history, so that students can understand the deeds of chemists in the process of chemical development and help students feel the spirit of chemists, which can help students establish the concept of loving the motherland and scientific learning[10]. Teachers can also assign a long-term task of understanding the story of chemists or the relationship between chemistry and traditional culture in China, so that students can independently understand the history of chemistry, and increase their feelings of patriotism and scientific spirit, thus improving their enthusiasm for learning chemical knowledge. Chemical experiments should be presented to students more often, so as to stimulate students' interest in learning. Teachers should give students some help in the process of experiments, help

them complete the experiments smoothly, enhance students' self-confidence, and at the same time cultivate students' core literacy.

5. Application Strategy Analysis

In order to understand students' acceptance of implementing problem-based teaching strategies, a “student questionnaire on problem-based teaching strategies” was designed. There are 10 multiple-choice questions in this questionnaire, 50 questionnaires were distributed and 45 were recovered, of which 43 were valid, and the effective rate was 86%.

The survey results of students' liking for the teaching methods of problem-based situational teaching strategies are shown in Figure 1:

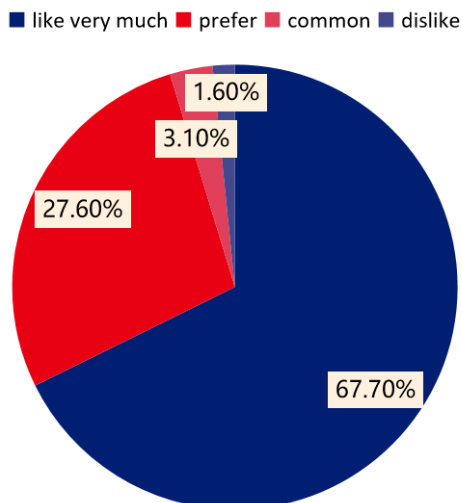


Fig.1 How Much Students Like the Teaching Methods of Problem-Solving Teaching Strategies

The results show that 95.3% of the students agree with the problem-based teaching strategy, which shows that the problem-based teaching strategy can satisfy students to carry out inquiry activities while carrying out chemical experiments and give full play to students' dominant position.

The survey on the difficulty of students' participation in problem-based teaching strategies shows that 33.8% of students are easy to participate in the prediction, observation and explanation of problem-based teaching strategies, and 54.4% of them can participate (Figure 2).

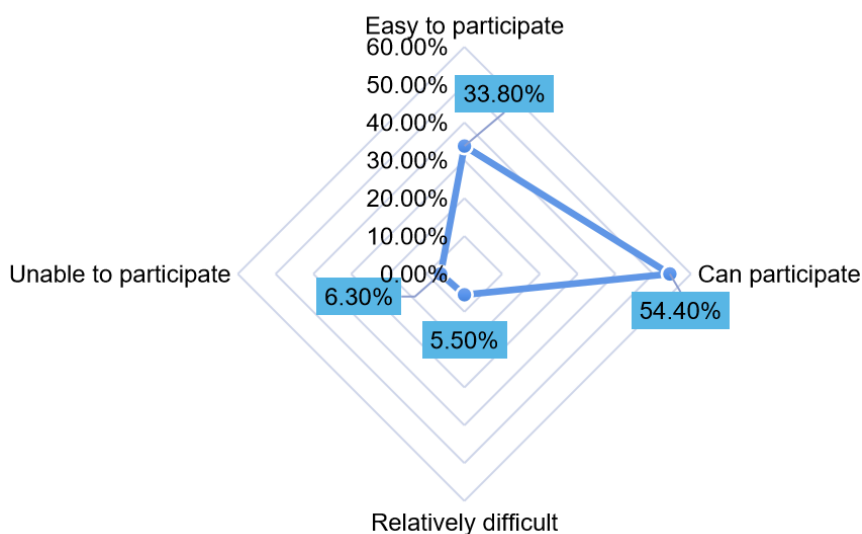


Fig.2 Investigation on the Difficulty of Students' Participation in Problem-Based Situational Teaching Strategies

It can be seen that in the classroom where the problem-based teaching strategy is implemented, students' participation is high. Implementing the problem-based teaching strategy has certain

requirements for students, and they need to carry out activities on the basis of certain knowledge. Therefore, it is particularly important to guide students to solve problems through existing knowledge in the process of implementation.

In the process of implementing the problem-based teaching strategy, we not only pay attention to students' thinking and exercise their thinking ability, but also organize students to speak and express their views in the links of prediction and explanation, so as to promote students' active thinking and cultivate their language organization ability. Problem-based situational teaching strategy is a teaching strategy based on experimental inquiry. After the prediction, students observe the experiment with the idea of verification and verify the conjecture, and cultivate students' scientific inquiry spirit in this process.

6. Conclusions

In the process of teaching, college chemistry teachers should combine the contents of textbooks, deliver the contents related to core literacy to students, train students' independent thinking ability and innovation ability, and let students strengthen the consolidation of chemistry knowledge through cooperation and interaction, quickly grasp the main points of knowledge and improve teaching efficiency. Under the background of core literacy, college chemistry education pays more attention to students' all-round development, which is a change from simply cultivating knowledge and skills to promoting students' all-round development. Teachers need to introduce innovative teaching ideas in the teaching process, so that college students can have a more diversified learning environment, so as to cultivate their comprehensive quality to a certain extent and let students develop good thinking habits. If teachers carry out college chemistry knowledge teaching according to the above strategies, they can infiltrate the core literacy in teaching, so that students can have the ability and interest of autonomous learning, thus forming the habit of autonomous learning of chemistry knowledge, ultimately improving the efficiency of college chemistry knowledge teaching and laying a solid foundation for developing students' comprehensive core literacy.

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