

Research on the Reform of Organic Chemistry Teaching Model Based on the Cultivation of Practical Ability

Fankun Meng^{1,*}, Jinjun Deng¹, Dongyan Zhang², Junying Jia¹

¹College of Chemical Engineering, Daqing Normal University, Heilongjiang Provincial Key Laboratory of Oilfield Applied Chemistry and Technology, Daqing 163712, China

²Dean's office, Daqing Normal University, Daqing 163712, China

*Corresponding author E-mail: mfk_823@163.com

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Abstract: Organic chemistry experiment course is one of the important courses in higher education to cultivate students' scientific spirit and innovative practical ability. The development of modern science and technology requires scientific researchers to have strong innovative ability and high practical ability. Organic chemistry experiment, as a specialized course of chemistry education, plays an extremely important role in cultivating students' innovative and practical abilities. Organic chemistry experiment skill training plays an important role in the cultivation of chemistry professionals. It can effectively improve students' innovative consciousness and ability. The concrete implementation of the reform of organic chemistry experiment teaching is of great practical significance to the cultivation of high-level talents with solid basic knowledge, strong practical ability and strong cooperative consciousness. Based on the cultivation of practical ability, this paper puts forward the ideas and methods of organic chemistry teaching reform from the aspects of teaching content adjustment and updating, teaching method reform and the establishment of students' autonomous learning mode.

1. Introduction

Organic chemistry is an important professional basic course for pharmacy related majors in medical colleges and universities, which can provide necessary professional knowledge and scientific research skills for drug analysis, drug synthesis and other research work [1]. Organic chemistry is a basic subject to explore the unknown world from the level of organic molecules. It is an important compulsory basic course for undergraduate chemistry majors and related engineering majors [2]. Improving teaching methods to improve teaching quality and cultivate college students' comprehensive quality and ability is an important topic in the reform of higher education. When the development of science and technology and the changes in social politics, economy and culture have forced the corresponding adjustment and reform of teaching contents, teaching methods are also facing the requirements of the times that must be changed and innovated [3]. The current experimental teaching content and mode limit the enthusiasm and initiative of students to a certain extent. In order to change this situation, we have organized and guided students to conduct research-based learning, establish innovative learning research groups, and develop research programs for several years [4]. In order to adapt to the current development of chemistry and meet the needs of students' personal development, how to cultivate students' experimental ability and innovative ability in the university organic chemistry experiment teaching has become a problem for the majority of experimental teaching workers [5].

Organic chemistry is a discipline developed on the basis of experiments. It is undoubtedly a great advantage to implement innovative education in organic chemistry experiments [6]. Through the study of organic chemistry course, students can master the basic theoretical knowledge and experimental operation skills in the field of organic chemistry, which is conducive to the cultivation of students' scientific thinking and research ability, and lays a solid foundation for further study and research [7]. Organic chemistry experiment is an experiment-based science. Its teaching purpose is

not only to help students have a comprehensive perceptual knowledge and understanding of the basic concepts, theories and knowledge of organic chemistry, but also to strengthen the cultivation of students' innovative spirit and practical ability [8]. The cultivation of organic chemistry experimental skills plays an important role in the cultivation of chemical professionals. It can effectively improve students' innovative consciousness and innovative ability [9]. Based on the cultivation of practical ability, this paper discusses the thinking and exploration of organic chemistry teaching reform from the aspects of teaching content adjustment and updating, teaching method reform and the establishment of students' autonomous learning mode.

2. Adjustment and Reasonable Arrangement of Teaching Content

2.1. According to the professional characteristics of different experimental content

Determining reasonable teaching content is an important prerequisite for a good course, which not only ensures sufficient knowledge capacity, but also makes it easy for students to fully understand, digest and absorb. Innovative education is an education whose basic value orientation is to cultivate innovative spirit and ability. It can enable learners to understand the ideas and methods of predecessors to solve specific problems through learning existing knowledge. Students should not only answer questions, but also explain them according to what they have mastered, which will enable them to gradually learn how to use rigorous thinking to organize their own language to accurately express their views. In order to reform the experimental teaching of organic chemistry, we must first analyze the existing problems in the current experimental teaching so as to have a definite object in view. In the organic chemistry experiment teaching, the teaching mode has always been that the teacher first talks about the experiment principle, operation steps and matters needing attention, and then the students imitate the operation [10]. In the process of organic chemistry experiment, if the experimental content is divorced from the theoretical teaching content, students often show inertia in thinking and are not serious enough about the experiment. Through collective lesson preparation, brainstorming, fully absorbing teachers' opinions, selecting standardized teaching materials, and combining with students' professional orientation, appropriate teaching contents are determined.

2.2. Pay attention to the hierarchy of experimental contents

When choosing the experimental content, we pay attention to the combination of theoretical courses, so that students can have sufficient knowledge of the experiment before entering the laboratory, and avoid blind and empty experiments. Organic chemistry is a subject based on experiments. Its definitions, theorems, laws and laws are all based on a large number of experiments and practical activities. Therefore, the experiment can not be confined to the experimental content arranged in the textbook step by step. By changing the teaching methods of experimental courses, students can become the main body of teaching, change from passive to active, and stimulate students' interest. This is not only conducive to students to master the knowledge they have learned, but also conducive to cultivating their scientific attitude to explore the unknown world. The experimental teaching of organic chemistry should not be limited to enabling students to acquire a certain amount of knowledge or to learn only the synthesis of one or two substances. More importantly, it should develop and cultivate students' innovative consciousness and ability to apply knowledge creatively.

In classroom teaching, students are required to explain and demonstrate, which turns students from passive recipients of knowledge to active discoverers, helps to improve students' initiative and enlivens classroom atmosphere. Using a large number of mechanical calculations and complex logical operations, it can flexibly adapt to and deal with various complex and fuzzy situations, and solve the problem quickly. The network system connected with each other according to a certain topological structure has nonlinear large-scale adaptive dynamic characteristics. Figure 1 is a typical neural network model.

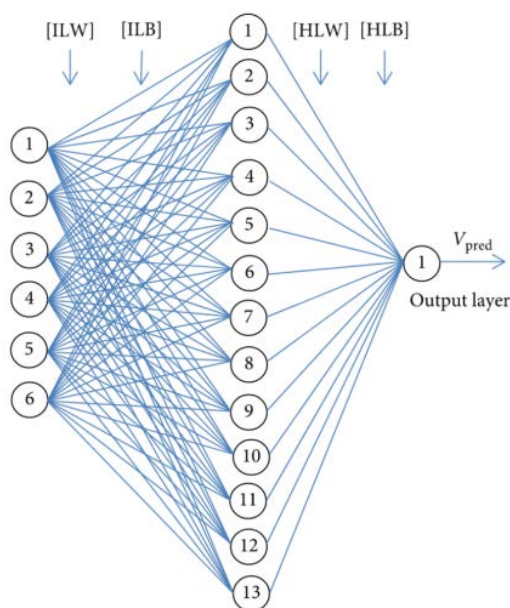


Fig.1. Typical neural network model

3. Rational Use and Innovation of Teaching Methods

In addition to organic chemistry theory course, organic chemistry experiment course is also related to comprehensive chemistry experiment course and instrumental analysis course. Students' direct participation in scientific research activities has greatly increased their interest in learning, acquired methods and skills, exercised their thinking, and truly realized the goal of cultivating innovative education ability. First of all, we should make students realize the importance of learning organic chemistry, strengthen professional education, and enhance the interest of classroom and the attraction of organic chemistry. Because students do not have the ability to explain systematically and smoothly, the understanding of the experimental content can not be completely correct. There will inevitably be errors in the process of explanation and demonstration. Teachers need to correct and guide them in time. Organic chemistry is an experiment-based science, which is divided into two parts: theory and experiment, emphasizing the combination of theory and practice. A good curriculum and training system is conducive to the coordinated development of students' theoretical knowledge, practical ability and comprehensive quality.

In order to improve students' experimental ability and innovation ability, it is not enough to confine to the organic chemistry laboratory, so the organic chemistry experiment course should make full use of the scientific research resources of the school. Referring to the practices of relevant domestic universities, a set of performance evaluation methods as shown in Table 1 is designed.

Table 1 Method for evaluating the results of organic chemistry experiment courses

Examination content	Assessment			Final assessment	Design experiment
	Laboratory report	Experiment preparation	Experimental operation	Theoretical examination	
Weight, %	7	23	31	15	24

Classroom teaching methods are related to students' interest in learning. An excellent teacher can vividly describe boring classroom contents. The cultivation of innovative and practical ability is related to the employment and development of students after entering the society and to the driving force of social development. Teachers only put forward research requirements and give guidance when necessary, without limiting the specific experimental methods and instruments used. The reform of this teaching method enables students to analyze and solve problems from multiple angles and in multiple directions, and effectively trains students' divergent thinking. Experimental teaching is an important link in training students' ability to integrate theory with practice, analyze problems and solve problems. It is also an important way to implement quality education, cultivate innovative

talents and promote the transformation from knowledge to ability. In organic chemistry experiments, some toxic and volatile organic compounds are often used. At the same time, most of the products synthesized are wastes. If improperly treated, it will not only affect human health. In the process of experiment teaching, teachers' and students' behaviors are included. Reasonable evaluation of both sides can improve teaching more scientifically and comprehensively according to the actual situation and improve the efficiency of experiment teaching.

The evaluation system of experimental results has a direct impact on students' attitudes and enthusiasm in experimental learning. Standardized examination system of experimental results can fully mobilize students' learning enthusiasm and cultivate their comprehensive quality and innovation ability. In order to enable students to play a principal role in the teaching process, we should pay close attention to the preparatory link of the experiment, check the preview report before the experiment or ask questions in class to check the preview situation of the students. If the students want to be able to answer the questions, they must carefully preview and think positively. We pay attention to the reform of experimental teaching methods. In a limited time, students will master the experimental theory of the subject, the basic methods of subject research, and guide students to understand the development of the frontiers of the discipline. After the teacher corrects and comments the practice questions, the answers are uniformly published in the public mailbox, so that students can correct the wrong questions and cultivate students' self-learning ability. Carrying out learning as the main body and teaching as the leading teaching concept, students are easy to experience the fun of thinking experiments, gaining a sense of participation and a sense of accomplishment in learning, which is conducive to the cultivation of students' innovative ability and experimental ability.

4. Conclusions

Innovative education advocates students to learn to learn, develop intelligence, improve quality, and develop abilities. In the teaching of organic chemistry, teachers, as important organizers of teaching activities, need to combine the characteristics of the discipline, development trends, professional characteristics and the level of knowledge base of students. To cultivate students' innovative ability, teachers must first have a sense of innovation, incorporate students' innovative ability into the teaching plan, and implement it purposefully. The implementation of organic chemistry experiment innovation teaching reform in experimental teaching has important practical significance for cultivating high-level Chinese medicine talents with solid basic knowledge, strong practical ability and adapting to the needs of modern society. In recent years, students have participated in innovative experimental programs for college students, published papers and won prizes in college students' chemical experiment competitions. From these aspects, organic chemistry experiment courses have achieved good results in cultivating students' innovative and experimental abilities. We should firmly grasp the teaching reform to explore, pay special attention to all aspects of teaching, flexibly use various teaching methods, and improve students' learning efficiency and teaching effect. Only in this way can we meet the requirements of the information age for medical talents and strive to train modern talents with high quality and innovative ability that are suitable for future medical development.

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