

Analysis on the Construction of Innovative Ability Training Mode for Students Majoring in Applied Chemistry in Colleges and Universities

Cheng Ma, Yongming Zhang,* Yuzhen Zhao, Zemin He, Haiyang Wang, Jianjing Gao, Huimin Zhang, Zhun Guo,

Yang Zhao

Xi'an Key Laboratory of Advanced Photo-electronics Materials and Energy Conversion Device, School of Sciences, Xijing University, Xi'an 710123, Shaanxi China. E-mail: zhangyongming@xijing.edu.cn

Abstract: Based on the training objectives of students majoring in applied chemistry in colleges and universities, this paper puts forward the construction ways of the training mode of students' innovative ability, in order to cultivate students' innovative thinking and ability through the optimization and reform of teaching, improve the teaching quality of applied chemistry, and lay the foundation for the society to cultivate more innovative talents.

Keywords: Colleges and Universities; Applied Chemistry; Students' Innovative Ability; Training Mode

1. Introduction

With the rapid development of science and technology and the increasingly fierce competition for social talents, it is imperative to cultivate college students' innovative ability. Committed to cultivating applied compound talents with super practical ability, professional scientific research ability and innovative development ability is the essential demand for colleges and universities to practice socialist core values, actively integrate discipline characteristics and build an educational power. It is also an inexhaustible driving force for the construction of modern ecological civilization.

2. Objective of cultivating students' innovative ability of applied chemistry in colleges and universities

Applied chemistry is an important major in science and engineering in colleges and universities. It aims to cultivate innovative and applied talents who have good scientific and cultural literacy, master basic chemical knowledge and skills, and have innovative consciousness and practical ability, which can engage in technology development, scientific and technological research, education and teaching in chemistry and related fields. Therefore, colleges and universities should take this as the training goal and combine the school running characteristics of their majors, find out the school running orientation of applied chemistry, and focus on the future career development needs of students, in order to accurately locate and refine the connotation of talent training goal based on sufficient market research and teaching analysis, and maximize the application needs of the state and society for innovative talents. Colleges and universities should also regularly evaluate the talent training objectives of applied chemistry specialty in line with the current social, economic and scientific and technological development, form a flexible and adjustable professional teaching and development orientation, and reasonably optimize the talent training objectives.

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3. Construction of innovative ability training model for students majoring in applied chemistry in colleges and universities

3.1 Optimizing the training program and improve the professional curriculum structure

Students' innovation ability should be based on wide-ranging professional knowledge and good comprehensive quality. It is difficult to do it only by single professional knowledge. Therefore, it is particularly critical to strengthen the connotation innovation and extension expansion of students' professional basic education and formulate a reasonable curriculum system. Firstly, colleges and universities should improve the curriculum structure of applied chemistry, follow the principle of "less but better", and set up public basic courses and professional basic courses respectively to ensure that students learn solid and useful basic chemical knowledge. These teaching contents should run through the whole process from the first semester to the fourth semester; Professional courses should be relatively independent but related, and they should be arranged in the fifth semester; In the sixth semester of teaching, students can determine different professional development directions and learn limited courses related to their majors according to their own interests and learning characteristics; Secondly, colleges and universities need to set up multiple professional optional courses for students to choose independently. Students are required to complete the required credits before they can complete their courses; In addition, colleges and universities should also set up a large number of public elective courses throughout the university, expand the scope for students to choose courses, and require students to complete corresponding credits during the four-year period of the university, as well as add the weight proportion of elective courses in the overall curriculum structure, and allow students to choose courses across departments and majors, so that students can base themselves on a major, and start more comprehensive interdisciplinary learning. It should be noted that teachers should also actively improve students' information literacy, cultivate their ability to use the network and simulation training platform, and promote students to have greater opportunities to contact the development frontier of professional disciplines and deeply understand the future development trend of the major.

3.2 Innovating classroom teaching and improving teaching forms

Classroom is the basic form of implementing teaching. The cultivation of students' innovative consciousness and ability should permeate into all courses of professional teaching. Teachers should not only teach professional knowledge, but also implement innovative education. They should create and introduce new teaching situations according to students' professional cognitive level and life experience, so as to stimulate students' desire for knowledge and exploration. In actual teaching, we should actively create a harmonious classroom atmosphere for students, encourage students to think creatively, and adopt diversified classroom teaching forms, in order to guide students to put forward questions and opinions, and promote students to imperceptibly study independently; At the same time, we should also strengthen the mutual penetration and overlap among various disciplines, and constantly expand students' innovative thinking space, so as to pay attention to the organic integration of professional subject knowledge and cutting-edge science and technology, expand the amount of information in classroom teaching, and mobilize students' innovative consciousness and spirit, which will be more conducive to the improvement of students' comprehensive professional quality.

3.3 Constructing a new experimental teaching mode to improve students' independent practical ability

As mentioned above, applied chemistry is highly practical, so experimental teaching occupies an important teaching position. The quality of experimental teaching will directly affect whether students have good autonomous learning ability, practical ability, problem analysis and solution ability, scientific research and innovation ability. Therefore, teachers should pay full attention to the links of experimental teaching, actively explore how to improve the quality and efficiency of experimental teaching, and put the cultivation of students' practical ability and innovative ability into experimental teaching.

Therefore, the author suggests that the experimental teaching of applied chemistry can be integrated into three teaching modules, including basic chemical experiment, professional chemical experiment and comprehensive chemical experiment. Basic and comprehensive chemical experiment is to optimize and integrate the original four chemical experiment teaching contents, break through the definition of chemical discipline branches and the division of laboratories, and actively abandon some outdated experimental contents, low experimental starting point and repeated similar experimental projects, to appropriately retain some necessary, targeted and confirmatory experimental projects; At the same time, the proportion of comprehensive and design experiments is added, and the basic chemical experiments are set in the first five semesters respectively, while the comprehensive chemical experiments are set in the sixth

semester, so as to ensure that students can comprehensively apply the theoretical knowledge of various disciplines in their major on the basis of basic experimental skills, and ensure that students' scientific research ability can be continuously honed and improved. Professional experiments are improved on the basis of basic and comprehensive chemical experiments. They are suitable for the sixth and seventh semesters. Different experimental projects are arranged in combination with different directions of the specialty. In addition, in the setting of experimental projects, teachers should not only consider whether they can broaden students' professional knowledge, but also focus on the difficulty of operation, pay attention to cultivating students' ability to independently analyze and solve practical problems in experimental teaching. We should establish the student-oriented teaching concept, improve the development of the laboratory, and let students have more opportunities for independent experiments. Through the open management of the laboratory, students are encouraged to actively use their chemical knowledge and search a large number of chemical resources to solve problems from a multi-disciplinary perspective, fully mobilize students' enthusiasm for independent learning and practice, and create conditions for students' personalized development, in order to better cultivate students' hands-on operation ability and innovation ability.

3.4 Improving the teaching evaluation system and building an innovative incentive mechanism

In the teaching of applied chemistry in colleges and universities, the traditional assessment and evaluation system is not conducive to the cultivation of innovative and applied talents. Its assessment and evaluation model is too single to truly feed back the students' actual learning level and ability. Practical and effective teaching evaluation should not only pay attention to the comprehensive assessment of professional knowledge, but also reflect the assessment of students' application and innovation ability. Therefore, teachers must improve the new teaching evaluation system, pay attention to the diversification of assessment methods and the autonomy of assessment time, and take students' daily writing of special reports and academic papers, participation in professional knowledge competitions and scientific research projects as the indicators and categories of assessment to evaluate students' mastery of professional knowledge and skills in an all-round, multi angle and whole process assessment way. At the same time, colleges and universities should also build an incentive mechanism for students' innovative consciousness and achievements, and give positive encouragement and praise to students' innovative actions and achievements, such as the implementation of innovative credit system, the establishment of scientific research reward policy, etc.

In addition, the evaluation of teachers' teaching can not only assess how much knowledge teachers teach students and how much knowledge students master, but also evaluate whether teachers pay attention to cultivating students' innovative thinking and ability. Colleges and universities should build a special teaching system, support and encourage teachers to actively explore the teaching methods of cultivating students' innovative ability on the basis of teaching professional knowledge and skills, and put them into practical teaching at the same time.

4. Conclusion

In short, the cultivation of students' innovative ability in applied chemistry in colleges and universities is not an overnight thing. It is a long-term systematic project. Colleges and universities should constantly optimize and innovate the professional teaching system in the traditional talent training mode, help students broaden their horizons and broaden the scope of knowledge, so as to enable them to access the scientific frontier and professional information in the current professional field. Only by continuously deepening the professional talent training system, optimizing and improving the teaching content and innovating the traditional teaching methods, can colleges and universities effectively cultivate applied innovative talents with a high sense of social responsibility, solid professional knowledge and skills and good innovation ability.

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