

Exploration and Practice of Cultivating Applied Chemistry Professionals in Colleges and Universities

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Abstract. As one of the most important majors in Higher Education in China, applied chemistry is closely related to the development and progress of the country. With the continuous expansion and emergence of new knowledge in chemical industry, the requirements for the specifications and quality of Applied Chemistry professionals are increasing, which requires Applied Chemistry professionals to have stronger comprehensive ability and professional skills. Obviously, the traditional teaching method of Applied Chemistry has been unable to adapt to the new trend of social development. As a talent training base, universities must adapt to the development of the times, actively explore and put into practice in the reform of talent training mode, so as to maximize the delivery of the highest standards of construction talents for the society.

Introduction

Applied chemistry plays an irreplaceable role in the development of our national economy. In order to promote the development of our national economy, a batch of applied research talents are urgently needed. For this reason, many colleges and universities in our country have established Applied Chemistry Specialty one after another. With the rapid development of global science and technology and the new requirements of China's economic transformation and upgrading, the social requirements for the training specifications and quality of Applied Chemistry professionals are constantly improving. In recent years, with the deepening of education and teaching reform, the market has put forward new standards for talents. The country needs not only theoretical talents, but also people with practical experience and good practical ability. Applied chemistry is a subject between chemistry and industry. It pays attention to experimental application and scientific research. It has more requirements for new products and processes, and higher requirements for talents. As an important base for talent training, colleges and universities must adapt to the new development forms and requirements, timely reform the training mode of Applied Chemistry professionals, adjust and improve the professional teaching system, and maximize the training of high-quality professional and technical personnel for the motherland and society. However, due to the extensive and profound content of Applied Chemistry and the wide range of fields involved, the training mode of Applied Chemistry professionals presents the characteristics of universality, comprehensiveness, complexity and particularity. In order to cultivate more talents for the society, colleges and universities must perfect the major of Applied Chemistry and do a good job of practical exploration. [1-5]

Open Question

Many colleges and universities in our country have established Applied Chemistry specialty, aiming at cultivating students' practical ability and innovative thinking ability, so that students can create more products with independent intellectual property rights after entering the society. According to the survey and statistics, there are still many problems in the practical setting and implementation of Applied Chemistry Specialty in Colleges and universities in China, which seriously restricts the

teaching quality of the course, and is not conducive to the training of professionals with outstanding theory and practice, and fails to achieve the desired results. It is mainly manifested in four aspects: First, infrastructure. Applied Chemistry is a highly practical specialty. Although some colleges and universities have set up this specialty, they have insufficient investment, funds and large-scale instruments and equipment, especially the construction of experimental conditions and practice bases. The laboratories and experimental equipment used for applied chemistry specialty are mostly left over from other specialties or used by general chemistry specialty. In addition, there is a lack of sufficient practice base and the connection with the practice base is not close enough. Students' practice is usually just a visit, which can not translate theoretical knowledge into academic practice ability. Second, curriculum design. The course design is reasonable and orderly, so that students can gradually master the relevant applied chemistry knowledge from shallow to deep. However, in the implementation of the corresponding training program, many unreasonable phenomena are found, such as the order and mode of course opening, and some teachers do not even understand their own teaching courses. Thirdly, as applied chemistry is a new technical specialty course, many schools do not have enough teachers' reserve, the strength of teachers is weak, or lack enough teaching experience, the professionalism is not strong, and there is no professional academic leader, or even other professional teachers to teach Applied Chemistry specialty, so it is impossible to arrange teaching courses reasonably. It is difficult to stimulate students' learning enthusiasm and to cultivate students with deep theoretical knowledge and strong practical ability. Fourth, the level of scientific research is limited. Although applied chemistry has made some achievements in construction and development in recent years, there are still fewer national key topics and limited research capacity.[6-8]

Relevant measures taken

To strengthen the quality and ability of Applied Chemistry professionals and do a good job in scientific development, we must adhere to the combination of theory and practice, transform theoretical knowledge into practice, and improve students' all-round ability. In order to give full play to the role of applied chemistry graduates in China's national economic development, the following measures can be taken in view of the problems existing in the construction of Applied Chemistry Specialty and the cultivation of students' practical ability in China's colleges and universities: First, scientific orientation of training objectives. The undergraduate talent training program in Colleges and universities is a programmatic document for realizing the goal of undergraduate talent training and guaranteeing the quality of talent training in Colleges and universities. It is also the basic basis for organizing curriculum teaching, standardizing teaching management, conducting graduation audits and other aspects of education and teaching in Colleges and universities. The training goal and mode of Applied Chemistry Specialty in Colleges and universities are to train innovative talents, and the cultivation of innovative talents is the top priority of talent work. Regular revision and improvement of undergraduate talent training program is not only the requirement of reflecting the concept of talent training with the times, but also one of the important contents of undergraduate education and teaching reform in Colleges and universities. Schools and teachers should formulate a variety of measures and methods to encourage students to study hard and master profound professional knowledge and a variety of other technologies and abilities. Through multiple positive guidance to students majoring in applied chemistry, they are encouraged to explore and think independently, to stimulate students' interest in innovation, and to cultivate students' sense of teamwork and dare to pursue the spirit of exploration and innovation. Institutions of higher learning should scientifically adjust the existing training programs of Applied Chemistry Specialty in light of their own conditions, and determine their own training objectives and modes. Second, improve infrastructure. Perfect experimental conditions, provide students with external simulation facilities to explain theoretical knowledge in the process of learning theoretical knowledge, so that students can easily understand theoretical knowledge, but also enhance the impression of theoretical knowledge. For example, according to the characteristics of Applied Chemistry specialty, spectral laboratory, comprehensive

analysis laboratory, electrochemical laboratory and synthetic laboratory can be set up. Special practice bases can be established. If conditions permit, the school can build its own simulated practice base. By purchasing a complete set of production equipment and being guided by professional teachers, the students can visit it first and then operate it by themselves. They can stimulate students' interest and practice their ability. In addition, they can expand the practice base by means of "school-enterprise cooperation". Third, the establishment of professional teachers. Strictly enforce the selection system of teachers, strictly prohibit the use of non-professional teachers, enrich teachers' theoretical knowledge and improve teachers' teaching level. Send existing teachers to training classes for further study, change their educational concepts and methods, stimulate students' interest in learning and improve classroom teaching efficiency in the process of teaching. Schools should strengthen the training of teachers and build a strong quality, ability and subject technology. Highly skilled teaching team, actively introducing talents, on the basis of the existing focus on training analytical testing technology and materials chemistry talents. At the same time, we should improve the teaching evaluation system and formulate the teaching evaluation system, which not only judges teachers' teaching results by students' academic achievements, but also integrates students' evaluation of teachers and teachers' performance in normal work to evaluate teachers' role in teaching comprehensively. Fourth, optimize curriculum design. The purpose of setting up applied chemistry specialty is to cultivate students' practical operation ability of applying chemical knowledge to production and life. The courses of Applied Chemistry Specialty involve various contents. Therefore, in the process of setting up and setting up curriculum objectives, we should focus on providing external conditions for students to exercise their practical operation ability. Teachers must reconfigure teaching according to the current market demand. On the basis of perfecting theoretical knowledge, we should increase the number of practical courses, provide a platform for students to participate in experiments, and plan moral education teaching, basic theoretical knowledge and professional level in the curriculum, so as to cultivate high-quality talents. Fifth, strengthen the Industry-University-Research linkage and promote the construction of internship bases in schools. The integration of production, teaching and research in universities is mainly embodied in scientific research cooperation and teaching cooperation. Through the co-construction of internship bases in schools, the win-win model of schools, students and enterprises can be realized. Colleges and enterprises jointly study and establish the future employment needs of enterprises, formulate training programs for relevant professionals in accordance with relevant needs, and build practical training bases in combination with enterprise specialties and professional needs; strengthen practical teaching for capacity-building in teaching methods, such as training of practical skills.[9,10]

Summary

Nowadays, the requirements for the specification and quality of Applied Chemistry professionals are increasing. In order to make our applied chemistry profession develop better, excellent applied chemistry professionals are indispensable. As a talent training base, universities must adapt to the development of the new era, adjust and improve the teaching system in time, reform the talent training mode, take students as the center, and constantly optimize the training mode, so as to make the training mode of Applied Chemistry professionals in Colleges and universities more adapt to the law of students' growth and development, and enable students to have a solid theoretical knowledge base, at the same time. It also has strong application ability.

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