

Discussion and Practice of the Teaching Mode of Analytical Chemistry Experiment Course in Higher Vocational Education

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Abstract: With the rapid development of China's economy and the further refinement of social division of labor, the demand for professional and technical personnel with certain professional application skills and basic professional knowledge is also increasing. This is also the core goal of higher vocational education in China. The characteristics of higher vocational education, which is different from ordinary higher education, also determine the special attention of higher vocational education to the cultivation of practical application ability. The Analytical Chemistry Experiment Course is an important practical course for developing professional knowledge and skills in higher vocational education. This paper studies the analytical chemistry experiment course, clarifies the problems existing in the current chemistry experiment course in higher vocational education, and gives the effective measures for the chemistry experiment course teaching reform.

1. Introduction

With the continuous development of China's economy and society, there is a growing demand for high-tech application talents with basic professional knowledge systems and application of professional skills. The orientation of higher vocational education is to cultivate professional technical application talents for the country and society. Therefore, the development space of higher vocational education is huge. Whether students who graduate from higher vocational colleges have good employment prospects and achieve good employment achievements are largely determined by his ability to apply technology. Higher vocational education is significantly different from the characteristics of ordinary higher education. It determines that higher vocational education is oriented to the needs of the market, and the ability of technology application is the core to build a student training program for higher vocational colleges^[1]. Unlike ordinary colleges and universities, which are based on professional theoretical knowledge and supplemented by skills and application, cultivate theoretical and scientific research talents, the training system and curriculum design of higher vocational education is based on the cultivation of professional and technical application ability, and strengthens the practical teaching of relevant professional skills to cultivate technical and applied talents.

Under this background of education, experiment and practice are important components of

higher vocational education. Therefore, the importance of analytical chemistry experiment courses is self-evident. The Analytical Chemistry Experiment Course is a basic course to cultivate students to apply chemical analysis and testing techniques. The teaching goal is to establish the professional application skills that students need for their professional and technical careers through the practice of experimental courses. However, there are still many problems in the current analytical chemistry experiment course, and the real teaching effect is not very good. In order to better cultivate professional and applied talents in the field of chemical analysis and inspection, it is necessary to analyze the existing teaching problems and propose practical measures for the teaching reform of the analytical chemistry experiment course.

2. Current Problems in the Analytical Chemistry Experiment Course in Higher Vocational Education

2.1 The less importance of analytical chemistry experiment courses

The core of higher vocational education is to cultivate the application ability of students' professional skills. The analytical chemistry experiment course is one of the most important ways to cultivate students' chemical analysis and testing skills, whose importance and necessity are self-evident. However, in the actual teaching process, the analytical chemistry experiment course has not received the attention it deserves^[2]. In higher vocational colleges, the emphasis on theoretical courses and the contempt for practical training are still widespread. This misconception led to the failure to give priority to the faculty arrangement, class allocation, etc. of the analytical chemistry experiment course. As a result, the teaching effect of the analytical chemistry experiment course is not good, it is difficult to achieve the training objectives of the course, and ultimately affect the core teaching purpose of the application of professional technology in vocational colleges.

2.2 Obsolete teaching mode of analytical chemistry experiment course

Most of the current higher vocational colleges still use traditional teacher-to-student infusion teaching mode. Specifically embodied in the analytical chemistry experiment course, the main performance is that the experiment is mostly a confirmatory experiment on the theory, lacking comprehensive and innovative design^[3]. In addition, before the experimental operation, the teacher will explain the whole experiment in detail, and even elaborate and guide each experimental step. The students simply reproduce the experiment according to the teacher's guidance, lacking their own independent thinking and self-exploration. The purpose of the experiment is only to pursue the correctness of the final experimental results. The obsolete teaching model of analytical chemistry experiment courses leads students to passively receive training without mobilizing their subjective initiative.

2.3 The failure of Analytical Chemistry course in focusing on training students' comprehensive quality

In the teaching process of the analytical chemistry experiment course, there is still a problem that only pays attention to the cultivation of a specific experimental skill of the student, only pays attention to the correctness of the final experimental result, and neglects the cultivation of the comprehensive ability of the student. Students will only master the specific operational steps of a certain type of experiment, and not be able to apply the skills flexibly. It also did not stimulate students' subjective initiative, did not cultivate their experimental thinking. And students did not know how to promote analogy. In addition, for the experimental report, most of the teachers will

provide ready-made templates, and will not explain the experimental records and experimental reports in a targeted manner, and exercise the student's standardized experimental records and experimental report writing skills. All kinds of phenomena indicate that the analytical chemistry experiment course does not pay attention to the cultivation of students' comprehensive experimental quality.

3. Reform Measures of Teaching Mode of Analytical Chemistry Experiment Course in Higher Vocational Education

3.1 Transforming educational concepts and strengthening the training objectives of analytical chemistry experiment courses

In order to effectively improve the teaching quality of analytical chemistry experiment courses and promote students' professional skills application ability, first of all, we must change the traditional educational concept and further strengthen the training objectives of the experimental courses^[4]. Higher vocational education is to meet the needs of the society for the application of professional and technical talents, and to train professional application technicians. Therefore, teachers should deeply understand and remind themselves at all times that the training objective of analytical chemistry experiment courses is to cultivate students' ability of chemical analysis and testing. We should transform traditional concept of subject-oriented education, and promote the concept of professional education of technology application. Under the professional education concept, teachers should pay attention to the connection between the analytical chemistry experiment course and the vocational skills in the actual work. On the basis of familiarity with the professional skills required in the actual work, teachers should consciously exercise and cultivate students' corresponding qualities and abilities. Based on the actual professional ability training requirements, the specific improvement measures are targeted selection of experimental content, and design of the experimental process. And we can carry out experimental design and cultivate students' experimental practice ability, combined with the hot or fast-developing technical points in the current professional field.

3.2 Strengthening the professional quality improvement of professional teachers

Teachers are the most important factor in the teaching of analytical chemistry experiment courses. The quality of teachers' professional literacy directly affects the quality of teaching. The reality is that the professionalism of teachers in higher vocational education generally needs to be improved^[5]. This is directly related to the idea that higher vocational education is not as good as ordinary higher education. For educators with good educational background and high comprehensive quality, the first choice is definitely ordinary colleges and universities, and few teachers with outstanding ability directly prefer higher vocational colleges. Therefore, on the one hand, the state, society and schools should increase their efforts to publicize the importance of higher vocational education and give certain policies and treatments a tilt. Only when the status of higher vocational education is improved, can schools recruit excellent teachers. On the other hand, current higher vocational education workers must develop a sense of continuous self-improvement. Society and schools should also actively organize teacher training activities to create good conditions for teachers' continuous self-improvement. Only by forming a social atmosphere in which teachers continue to improve themselves can promote the continuous progress of teachers, thereby improving the teaching quality of analytical chemistry experiment courses and promoting the cultivation of students' professional skills application ability.

3.3 Improving teaching methods to improve students' comprehensive quality

The Analytical Chemistry Experiment Course is a professional course focusing on experiment and practice. To improve the quality of teaching and promote the cultivation of students' professional and technical application ability, the direct and effective way is to improve the teaching method. By improving the teaching method, the teaching quality of the analytical chemistry experiment course can be effectively improved in a short time. Specifically, we must change the traditional mode of teaching. Through multimedia, information technology, as well as teachers' conscious guidance, we can create an inquiry-based, open-ended experimental atmosphere. We must emphasize designing and conducting experiments with questions, encourage students to discover problems in the experimental process, then make them to try to explain the problems in combination with theoretical knowledge, and finally verify the conjecture through experiments. Through this guided teaching method, we can increase the students' fun of exploration, stimulate students' subjective initiative, and cultivate students' self-learning quality and innovation consciousness. On the other hand, what we need to improve is to consciously choose experimental content, cultivate students' professional and technical ability, encourage students to apply for professional qualification examinations in professional fields, to lay the foundation for professional skills after graduation. In addition, teachers should also pay attention to the actual connection between teaching and society, and adopt open experimental teaching methods to improve students' comprehensive quality^[6]. In the process of teaching practice, we can actively promote social enterprises to enter the campus through the school, students go out of the campus to visit the enterprise, so that the experimental teaching of the school is not divorced from reality.

3.4 Establishing a scientific evaluation system to comprehensively evaluate the teaching effect

Assessment and evaluation are the summarization and test of the teaching effect, which is an important part of the whole teaching process. A good appraisal and evaluation system can effectively judge the teacher's teaching effect and the students' learning situation, thus promoting the teacher's teaching reflection and the student's learning summary, consolidating and enhancing the teaching effect. For the analytical chemistry experiment course, we need to establish a scientific and systematic evaluation system to assess students' basic knowledge, experimental operation, report writing and comprehensive application ability, especially focusing on students' problems detection, problem solving and Comprehensive hands-on ability. The assessment form and assessment time should be flexible and changeable, and striving to track and evaluate the students' learning situation in a convenient and efficient manner.

4. Conclusion

As an important basic course in higher vocational education, the analytical chemistry experiment course can effectively promote the goal of cultivating technical application talents in higher vocational education. In the current analytical chemistry experiment course, there are problems such as insufficient attention, backward teaching mode, and lack of attention to the cultivation of students' comprehensive quality. Combining the core objectives of higher vocational education to cultivate professional and technical applied talents, we should carry out targeted reforms in terms of changing educational concepts, improving teachers' professional quality, improving teaching methods, and establishing scientific evaluation systems, to improve the quality of analytical chemistry experiment courses, and promote the cultivation of students' chemical analysis and inspection ability.

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