Cultivation of Experimental Teaching Ability of Chemistry Major Normal Students Based on Core Quality of Subjects

Quan Han[a,*], Yiyan Su, Yingjuan Qu

School of Chemical Engineering, Xi'an University, Xi'an, 710065, China

[a] Xahquan@Hotmail.Com

*Corresponding Author

Keywords: Core Literacy, Chemistry Major, Experimental Teaching

Abstract: Curriculum Reform Has Shifted from Focusing on Students' Knowledge Structure, Cognitive Style, Learning Process and Curriculum Awareness to Focusing on Students' Core Qualities, Which Will Inevitably Lead to the Exploration of Teachers' Education on Students' Core Professional Qualities. Chemistry Experiment Teaching is One of the Core Parts of Chemistry Teaching for Chemistry Teachers. How to Adapt to the Requirements of Chemistry Teaching under the New Curriculum and to Train High-Quality New Curriculum Teachers is an Urgent Problem for the Training of Chemical Education Majors in Normal Colleges. in View of the Curriculum Reform under the Background of the New Curriculum, This Paper Analyzes the Deficiencies in the Chemical Experiment Ability and Quality of Normal Students, and Puts Forward That the Experimental Teaching of Normal Students Should Pay Attention to the Cultivation of Professional Quality Such as Experimental Teaching Ability While Paying Attention to the Cultivation of Scientific Quality.

1. Introduction

Teachers colleges and universities take training teachers as their goal. Today and tomorrow when they actively advocate and implement quality education, having innovative ability is an important requirement for qualified teachers [1]. The core accomplishment of students' development is a set of systematically designed educational goal framework, the implementation of which needs to promote the reform of all educational links as a whole and finally form a complete educational system with students' development as the core. Curriculum reform has shifted from paying attention to students' knowledge structure, cognitive style, learning process, curriculum awareness, etc. to paying attention to the core accomplishment of students' development [2]. In the traditional classroom where basic education is still based on improving test scores, teachers pay more attention to the transfer of books to students. The basic knowledge of classrooms is already high enough. In today's university chemistry teaching, experimental teaching is still a relatively weak link. There are still many problems. For example, students in chemistry education pay less attention to the study of experimental courses, lack of experimental design, low experimental operation skills, and poor experimental demonstration ability. This requires teachers to have a strong theoretical and experimental knowledge in addition to a solid theoretical basis, in order to play a role in the teaching of middle school chemistry [3]. However, the experimental ability of many chemistry education students in normal colleges is worrying, and it is especially necessary to strengthen the cultivation of students' experimental ability.

2. The Connotative Characteristics of Normal Students' Core Subject Literacy

2.1 Solid Comprehensive Quality of Discipline

It is the expectation of the society, parents and future students that normal students have comprehensive and comprehensive discipline accomplishment, and it is also the responsibility of discipline and specialty construction in normal universities. Normal students should master higher

  DOI: 10.25236/icatpe.2019.073

specialized knowledge and skill system. Core accomplishment is a person's advanced ability and human nature ability to solve complex problems and adapt to unpredictable situations. The formation of accomplishment depends not on simple classroom teaching but on students' participation in mathematics activities. It depends not on memory and understanding, but on perception and thinking. Students should have the necessary character and key ability to adapt to the needs of life-long development [4]. This refers to the quality needs of students' own development and has an individual nature. Core literacy is a broader concept than knowledge, skills, and so on. It is a collection of related knowledge, skills, attitudes, values and emotions [5]. Finally, core literacy is action-based and context-oriented. This kind of creation consciousness of normal school students is the wisdom and ability of education. It is the perception and grasp of the curriculum, the reorganization and refinement of teaching resources, and the understanding and guidance of students.

2.2 Comprehensive Educational Skills

A professional feature of the teacher profession is that the teacher has an educational understanding ability. The key link in the role of education is the internalization of knowledge by students. Core literacy refers to the key literacy that contemporary people should have. Core literacy is not a comprehensive hodgepodge, but a key literacy in the entire literacy list [6]. Chemistry experiment teaching is the main means to train students' experimental ability in higher normal colleges. It is not only a bridge connecting classroom chemistry theory teaching, but also an effective way to train students to carry out experiments creatively in scientific research practice. This kind of skill requires systematic theoretical knowledge such as pedagogy, psychology and subject teaching theory to be studied and applied in practice, and also requires normal students to continuously comb and weave the knowledge they have learned [7]. Therefore, teaching based on core literacy requires teachers to grasp the essence of knowledge, create appropriate teaching situations, inspire students to think, and let students understand the essence of knowledge while mastering the knowledge and skills they have learned. Therefore, the goal of education should adapt to the needs of the information society. The single-type talents of knowledge structure are not suitable for this era, and they need complex and innovative talents [8]. Teachers use the subject knowledge that permeates the individual world outlook, values, and methodology to collide with the students' original knowledge structure to realize the interpretation of the multiple educational significance of subject knowledge.

3. The Present Situation and Problems of Chemistry Experiment Teaching for Normal Students Majoring in Chemistry

3.1 Problems of Experimental Courses and Teaching Materials

Curriculum is the sum of teaching subjects and their aims, contents, scope, weight and progress stipulated for realizing the educational goals of schools at all levels. In the process of educational practice, many students have strong teaching ability of chemical theory knowledge, but poor ability of chemical experiment. The accumulation of this phenomenon has led to the weakening of the experimental teaching ability of college students. In view of this reality, we have carried out ideological education for students at the beginning of their schooling and cultivated their ambition to devote themselves to education. In the traditional chemistry experiment teaching, the course objectives are not clear, the selection content is outdated, and the curriculum is attached to the basic theory class, which leads to more simple verification experiments. The new curriculum standards require that students be the mainstay, but the status of teachers is still the chief of equality. When delegating power to students, it is also necessary to manage good services. In the future, chemical core literacy will be implemented through curriculum design, teaching practice, and education evaluation.

3.2 The Problem of the Construction of Experimental Teaching Teachers

The experimental teaching requirements are high and difficult, and the experimental teachers must be lean and of good quality, with the style of the elderly and the teacher. The core literacy of students' development will become the basis and starting point of curriculum design, leading and promoting the professional development of teachers, helping students to define the future development direction. When students do experiments, they only pursue experimental results. University teachers only evaluate students' experimental results. The results of the experiment are evaluated. It is precisely because of this unscientific attitude to evaluate the quality of experiments that students attach more importance to results than process when doing experiments. Teachers often don't pay attention to chemistry experiment courses, and there are no lesson plans or lesson plans, resulting in low quality of experiment teaching and low experimental ability of students. This requires teachers to set up a perfect image for students as far as possible, and use the “halo effect” that teachers always believe worthy of trust and respect in the eyes of students to implement and expand their influence.

3.3 Problems of Experimental Teaching Methods and Means

The current experimental teaching method is single, most of which adopts the form of “indoctrination”. The students are passive recipients and cannot meet the requirements of innovative education. For students from economically developed areas, the school laboratory facilities are perfect, students do experiments many times and have strong experimental ability. For students from economically underdeveloped areas, the school's experimental facilities are not perfect, and many students do experiments less frequently. In our experimental teaching, students are required to fully preview the textbooks before the experiment, write preview reports, and clarify the principles and procedures of the experiment. Check the preview before the experiment starts, and take it as one of the contents of the experiment evaluation. In experimental teaching, teachers seldom use modern educational technology, lacking diversity and flexibility. The experimental class is not arranged for many hours and students have few opportunities to train, which is not conducive to the mastery of experimental skills. As a result, teachers and students do not attach enough importance to chemical experiments. It gives rise to the idea that theory is more important than experiment.

4. Measures to Strengthen the Training of Experimental Ability of Students Majoring in Chemistry Education in Teachers' Colleges and Universities

4.1 Teachers Design Experimental Topics Based on Core Literacy Content

Core literacy is the key ability and necessity for individuals to solve real problems by using various knowledge, concepts and ideas in the face of complex and uncertain real-life situations in the information society and the knowledge economy era. Character. Reasonable subjects help students know that the experiments they want to design have clear goals in the pre-class preparation stage. When the experimental plan is set, there will be targeted selection devices, ask questions, discuss problems, form opinions, and structure models. Under the guidance of core literacy, teachers can use chemical core concepts and main knowledge to guide teaching, help students jump out of the complicated and messy knowledge, stand at a higher angle to understand chemistry and acquire scientific knowledge, so as to cultivate subject literacy. Secondly, a reasonable choice of topics should not only meet the students' curiosity and desire to explore, but also not be too simple to lose the significance of discussion and reflection. Only in this way can students be motivated to explore scientific knowledge and to recognize the objective world, because the laws and methods learned through experience can be understood and remembered for a longer time, and creative thinking and ability can be cultivated and improved in solving practical problems. At the same time of strengthening the basic skills training, cultivate students' ability to acquire new knowledge. At the same time, students are trained in experimental theory, experimental methods and experimental skills in a multi-level, all-round and systematic way.

4.2 Pay Attention to Preview Before Class to Provide Guarantee for Classroom Practice

Inquiry experiments often focus on the process of classroom inquiry and do not extend forward to focus on preview before class. The effect of inquiry lessons in which students do not have enough preview before class is not as good as that of teacher demonstration experiments. Through system establishment, environment creation, platform establishment, organization and implementation, various action measures to promote the formation of normal students' professional core literacy are generated, creating an atmosphere in the overall environment to awaken and train normal students to become the growth motivation of future excellent teachers. Preview before class is an important topic to test whether teachers' strategies, methods and means are effective. In addition to being able to control the class, teachers should also control the stage of preview and reflection before and after the class. By opening the laboratory, the students can design the experiment process and the necessary instruments and medicines by themselves, so that the students can complete the experiment independently without time limitation. By doing the experiment, the students can be more skilled in the operation and use of the experimental instruments. Therefore, teachers should restore the value of chemical experiments, stimulate students' enjoyment of inquiry learning, enlighten chemical thinking, train hands-on operation ability, guide students to understand and master chemical knowledge and skills, and cultivate rigorous scientific spirit and innovative potential. During the experiment, teachers induce students to actively brain and divergent thinking, so that they attach importance to the innovation of experimental methods and experimental process design, and promote thinking. It is necessary to track the adaptability and post-development of the graduates of the school in the beginning and after employment, and constantly reflect on the cultivation process. Only by systematically paying attention to and studying the overall process of teacher generation, can we effectively grasp the training strategy and effectiveness.

4.3 Using Extracurricular Experiments to Develop Students' Inquiry Ability

The classroom of the school is limited by time and space. The mobility of the chemical experiment guarantees the extracurricular extension of the classroom experiment. The extracurricular experiment can be carried out. The laboratory can be built in any real and safe environment. The experiment achieves the purpose of the exercise inquiry ability required in the course standard. In the process of cultivating, not only the professional subject knowledge, but also the cultivation of students' cognitive style, management ability, teaching skills, research methods and evaluation methods should be emphasized. Teachers should carefully design experimental inquiry activities in the classroom, guide them to complete the experimental operation in a standardized manner, analyze the observed experimental information and obtain conclusions, and at the same time, propose an optimization plan and dare to question and criticize. In chemistry experiment teaching, teachers can regard the experiment as a scientific research topic by proposing topics, designing schemes, classroom discussions, experiment operations, analyzing and discussing results and other means. Develop a good habit of integrating theoretical knowledge with practical life. Inquiry experiments can be small family experiments or inquiry experiments in open laboratories. Teachers can only gradually promote teachers' high-level cognitive construction and thinking innovation by transforming the received theoretical teaching knowledge into conceptual information in a potential sense through practice, and realizing its internalization and understanding so as to make it a personal quality and action criterion. As a supplement to the insufficiency of classroom experiments, it is very necessary to attach importance to extracurricular experiments to cultivate students' inquiry ability, which is also the learning method advocated by the new curriculum standard.

5. Conclusion

Normal education is related to the training of teachers in the future. The professional core accomplishment of normal students will directly affect the growth of teachers in the future. Good professional accomplishment of teachers, broad professional vision and comprehensive educational

practice ability can enable normal students to better integrate into educational practice. Therefore, every curriculum reform research carried out by the vast number of teaching and research workers is an examination of the core literacy system, which is of vital importance for the continuous improvement of the core literacy theory in the development. However, the cultivation of normal students' experimental ability is a subtle process. Only by changing ideas, establishing and perfecting scientific rules and regulations, cultivating students' ability to independently complete experiments and strengthening experimental examination can high-quality chemistry teachers be cultivated. As long as we persist in concrete and in-depth reform, and proceed from reality, establish an experimental curriculum system conducive to cultivating students' innovative ability and comprehensive quality, the task of experimental teaching reform will certainly be completed. We should transform core literacy into teaching objectives, devote ourselves to research and practice, attach importance to teaching design, change teaching mode, guide students to change their learning style, promote the formation of each student's chemical core literacy, and cultivate the future pillar of all-round development for society.

References

[1] Yao, Xiuwei., Gao, Hong., Meng, Qingguo. (2018). Fine reform of college physics experiments to improve the core literacy of normal students. Physics and Engineering, vol. 28, no. S1, pp. 189-192.

[2] Xue, Zhongxiang., Fang, Yuanyuan. (2018). Analysis of the Core Accomplishments of Teacher Education Profession from the Perspective of Educational Existentialism. Hubei Social Sciences, vol. 384, no. 12, pp. 168-174.

[3] Li, Feng., Liu, Ruixue., Ren, Youqun. (2018). Establishing Core Accomplishments and Cultivating Key Abilities-Rethinking the Revision of Curriculum Standards for High School Information Technology. Global Education Outlook, no. 1, pp. 46-55.

[4] Wang, Jian., Xie, Li. (2018). Teachers' Curriculum Ability Improvement Pointing to Core Literacy of Teachers and Students. Research on Teacher Education, vol. 30, no. 05, pp. 49-53.

[5] Wang, Junmin., Ding, Chenchen. (2018). Analysis of the concept and essence of core literacy-and analysis of the relationship between core literacy and basic literacy, advanced literacy and discipline literacy. Education Science, vol. 34, no. 163(01), pp. 36-43.

[6] Feng, Jian., Yu, Li., Xiong, Wei., et al. (2018). Teaching Practice of Flip Classroom in Comprehensive Experiment Course for Organic Chemistry Specialty. Experimental Technology and Management, no. 4, pp. 208-211.

[7] Shi, Ke., Shi, Bingtao., Yang, Liang. (2017). Influence of Exploratory Biochemistry Experiment Course on Innovation Ability of College Students. Shanxi Medical Journal, no. 21, pp. 105-107.

[8] Li, Xia., Zhao, Jing., Shen, Lan., et al. (2018). Biochemistry teaching design and experience centered on cultivation of thinking ability. Chinese Journal of Neurosurgery Disease Research, vol. 17, no. 05, pp. 72-75.