

Teaching reform and practice of Chemistry in local colleges from the perspective of normal professional certification

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Abstract

According to the basic concept of professional certification of "student-centered, production-oriented and continuous improvement" and the basic thoughts of "reverse design and positive construction", the specialty adopts the "Five measures simultaneously" of concept guidance, typical normal education, project promotion, evaluation and guarantee, and honor incentive to improve the teaching method, carries out extracurricular guidance and learning in accordance with the "four haves and one diversity", follows the practical teaching path of "practice-reflection- development", and reconstructs the educational practice mode of "educational internship, educational practice and educational study" to ensure the implementation effect of chemistry.

Keywords

Normal professional certification; Chemistry; Reform in education.

1. Introduction

For a long time, the dull normal education system has made some normal universities content with the current situation [1] and gradually lose competitiveness and attraction. It leads to many normal universities tend to integration [2-3] under the voice of transformation and is eager to get rid of the "normal label". The launch of normal professional certification in 2017 has revived the hope and confidence for many normal universities and majors. The normal professional certification concept based on "student-centered, production-oriented and continuous improvement" has also become an ideology, institution and cultural power to promote the improvement of professional education quality in normal universities [4-5]. At the same time, many majors actively promote teaching reform under the guidance of the certification concept. At present, academia has achieved a series of research results by systematically discussing the formulation of specialized training objectives [6] and the setting of curriculum system. However, few of these research results have been specifically implemented in the practice of professional teaching.

Liupanshui Normal University, a local college in Southwest China, has promoted the experimental work of professional certification since 2020. As the second batch of pilot majors, professional certification in chemistry has been carried out and successfully passed it. In order to provide some reference of the teaching reform on chemistry for other colleges or universities, this paper intends to introduce the relevant experience of the implementation of chemistry curriculum and the effective implementation of the concept of professional certification.

2. Current situation of Chemistry Teaching

The pattern, which includes student-centered, and multi-mode, multi-dimensional and multi means teaching implementation and learning inquiry, has been taken shape. However, in the process of teaching implementation, the phenomenon of emphasizing knowledge transfer, neglecting ability training and value shaping still exists in varying degrees which affects the improvement of talent training quality to a certain extent.

Although the practical course syllabus and scoring standards have been realized from scratch, there are still some problems in practical teaching, especially in educational practice, such as lack of flexibility in process evaluation, lack of comprehensiveness in content, lag in time, inaccurate scoring and so on.

Although the overall implementation and time allocation of classroom teaching, extracurricular guidance and extracurricular learning are basically reasonable, students' extracurricular learning still has problems such as weak initiative and poor self-discipline which affects the technical execution of pre class preview, after-school review and after-school homework, which reduces the effect of curriculum implementation for instance.

3. Teaching reform measures of Chemistry Based on certification standards

3.1. Promote the reform of teaching methods and improve the quality of classroom teaching

This reform measure is based on the requirements of the implementation plan of Liupanshui Normal University on further deepening the reform of undergraduate education and teaching and comprehensively improving the quality of talent development and the implementation plan of the cultivation and construction of first-class undergraduate courses of Liupanshui Normal University. The documents focus on "what normal students have learned" and "what they can do" after having been educated, emphasize clarifying the outcomes-based standards, connecting with requirement of society and taking the learning effect of normal students as the guidance, view the requirements of graduates' core competence, and reverse design teaching procedures. All these have promoted to form the following reform measures of curriculum teaching methods:

3.1.1. Concept guidance

Under the Subjective Mode of Teaching of "taking teachers as the leading, students as the center and development as the main line", the teaching quality has been steadily improved. We enhance teachers' teaching ability by strengthening the training of teaching methods, changing teachers' teaching conception. In the past three years, university-school have conducted short-term training for professional teachers for more than 30 person times and online training for more than 200 person times aiming at teaching modes such as Blended Learning and Flipped Class, teaching methods such as case-based and group cooperative exploration, information technology applying such as Chaoxing website and Rain Classroom, which has effectively changed teachers' teaching conception, enriched teachers' teaching methods, improved teachers' teaching ability and promoted the transformation of teaching style.

3.1.2. Typical demonstration

Our school actively carries out Young Teachers' Teaching Skills Competition and Teaching Innovation Contest for College Teachers, from which select excellent teachers with outstanding teaching ability and novel teaching methods for commendation. Besides, our school actively makes full use of excellent models and plays a typical exemplary and leading role through quality class, demonstration lesson, experience sharing and other activities. For example, in 2021, teacher fan Zhifang, who got the first prize in Young Teachers' Teaching Skills Competition and the second prize in the First Teaching Innovation Contest in our school, carried out a public demonstration course of physical chemistry for the teachers of the whole school. In 2021, teacher Liu Jia, the winner of the excellent prize of the First Teaching Innovation Contest of Guizhou Province, shared the experience of teaching method reform for the teachers of the whole school. Besides, teachers such as Bai Xinwei and Li Yu shared excellent cases for the teachers of the whole school.

3.1.3. Project promotion

In order to create a good atmosphere of teaching reform and research, we have launched a series of Teaching quality projects -- teaching content and classroom system reform project, Curriculum ideological and political demonstration course construction project, first-class curriculum construction project, curriculum assessment method reform pilot project, professional comprehensive reform pilot project, first-class profession construction project, key profession construction project and so on. The reform and innovation of curriculum system, teaching content and teaching methods was promoted through project construction. The major attaches great importance to curriculum reform. In the past three years, chemistry teachers have published 29 Teaching papers, won 31 education and teaching reform projects, and won the first prize of university-wide teaching achievements for two consecutive years.

3.1.4. Guarantee of teaching evaluation

In order to promote teachers to improve teaching methods and teaching quality, our university issued the implementation measures for students' teaching evaluation of Liupanshui Normal University, which demands to regularly organize students' teaching evaluation activities, and feedback the evaluation results to teachers so as to stimulate teachers to change teaching methods. The university implements the system of teaching information provided by students, who regularly feedback opinions about teachers' teaching and students' learning so as to promote teachers to improve teaching methods. Our school and major regularly hold student symposiums to listen to students' opinions or suggestions on teachers' teaching and students' learning, which are used to improve course teaching and teaching management. In addition, teachers are urged to improve their teaching methods and boost the teaching effect through the forms of the supervisors at university-school push the door to listen to lectures, the leaders of university-school listen to the lectures randomly, and the colleagues learn from each other to listen to the lessons.

3.1.5. Honor incentive

In order to guide teachers to improve teaching methods, devote themselves to teaching and educating people, and actively participate in education and teaching reform and research, our university has issued the measures of cultivation and reward for famous teachers, core teacher and new famous in Liupanshui Normal University, which rewards teachers who have performed well in the education and teaching reform at different levels. In addition, the school carries out the selection activities for selecting excellent teachers, model of teachers' morality and excellent teaching organization at the basic level every year to commend individuals and organizations who have made great contributions in education and teaching reform. Based on the good effect of educating people, our teachers have won the honorary title of "outstanding teacher of the municipality" for four consecutive years. In 2021, our school, as the only unit of the university, won the "Advanced Collective in Education Work in Liupanshui".

Based on the above measures, it has effectively promoted the reform of professional teachers' teaching methods. At present, chemistry teachers can basically determine the corresponding teaching content according to the curriculum objectives, and adopt different teaching methods according to the teaching content and students, such as case-based teaching, task-driven method, creating situation method, problem-oriented method, cooperative inquiry method, etc. All these can effectively promote the reform of classroom teaching methods and stimulate students' interest in learning. Professional teachers can make rational use of information technology network platforms such as Chaoxing website, MOOC and multimedia, classroom records and other learning resources to change the traditional teaching mode, promote the transformation of normal students' learning mode from single passivity to multiple autonomy, and effectively improve the quality of classroom teaching. Based on these, chemistry has

applied for 5 first-class courses and 3 have been approved (41 in total in our university) in the past two years, and the effect of course construction has initially appeared.

3.2. Strengthen extracurricular learning guidance and promote integration in and out of the class

The implementation process of each course of this major follows the law of normal students' growing, and arranges teaching activities centered on the learning effect and personal development of normal students which can basically promise that there are preview before class, tasks after class and guidance outside class. Extracurricular guidance and extracurricular learning are carried out in accordance with the "four haves and one diversity", that is, there are guarantees, resources, tasks, guidance and various forms. Teachers arrange learning tasks before and after class, actively carry out extracurricular guidance, answer questions offline more than 5 times per student per semester, and answer questions online in real time through Chaoxing website, QQ, Wechat group and other forms. Other forms of auxiliary guidance include tutorial system -- one-to-one academic guidance and personalized demand guidance, such as postgraduate entrance examination and teacher qualification certification. In addition, in order to improve the effect of extracurricular guidance and ensure students' extracurricular learning time, this major is the first in the university to adopt the system of Monday to Friday night self-study, in which we select two teachers every night to arrange students' learning tasks, and provide targeted guidance for students' curriculum learning, teacher qualification examination, postgraduate entrance examination, teaching skills training, etc.

Taking inorganic chemistry as an example, a class is divided into 5-7 extracurricular learning interest groups, and sets 8-10 extracurricular learning tasks according to the contents of key chapters. Each group carries out inquiry and discussion according to the task points, and the result is included in the daily performance according to the participation; teachers can master students' learning through background monitoring in Chaoxing website, feedback from class informants and interaction on communication platform, and carry out guidance and leading in real time to ensure the achievement of curriculum objectives; the allocation of classroom teaching, extracurricular guidance and learning time reaches 1:1.2.

3.3. Reconstruct the practical teaching mode and consolidate the basic teaching skills of students

The construction of practical curriculum system is an important starting point for the specialty to improve the quality of talent development [8-9]. According to the graduation requirements and following the practical teaching path of "practice-reflection-development", the educational practice mode of "educational internship, educational practice and educational research" is constructed, and the educational practice runs through the whole training process of normal students: (1) Formulate the outline of practical courses to ensure that the implementation of practical courses has a basis; (2) Revise the practical curriculum system and open up practical courses such as educational practice, educational probation, Microteaching and "three characters and one word". The credits of practical teaching account for 32.1% of the total credits, and the total number of educational practice is 20 weeks; (3) Establish more than 20 practice bases and multiple training rooms in campus to provide good conditions for the holding of practical teaching; (4) Implement the "double tutor" system in which college teachers and excellent middle school teachers jointly guide practical teaching, which including teaching observation, teaching practice, teaching and research activities, class management and educational research, to provide teachers' guarantee for students' practical training; (5) By holding a series of activities such as teaching skills competition for normal students, observing demonstration lessons, lectures by famous teachers and principals, selection of excellent teaching aids and so on, normal students can improve the educational practice ability. Through

the above measures, students' basic teaching skills, experiments, teaching and other basic skills have been effectively improved.

4. Reflection on continuous improvement of curriculum implementation

4.1. Classroom teaching

Strengthen teacher training to change the concept of education and teaching; promote the implementation of the curriculum from emphasizing knowledge transfer to paying equal attention to knowledge transfer, capacity building and value shaping, and from emphasizing theory over practice to paying equal attention to theory and practice, practical ability and innovation ability. In addition, on the classroom teaching, we should give full play to the guarantee role of teaching quality monitoring and evaluation, strengthen the supervision and guidance of the curriculum implementation process, promote the continuous improvement of teaching implementation behavior, and improve the quality of classroom teaching.

4.2. Practical teaching

Strengthen the construction and management of practical courses, consolidate the information construction of practical teaching platform, and gradually realize the real-time evaluation of practical teaching. By continuously optimizing the practical curriculum outline, assessment format and scoring standards, we can gradually solve the problems of lack of flexibility in process evaluation and lack of comprehensiveness in content. By strengthening the training of tutors, improve the practical teaching evaluation ability of instructors, on-campus and off-campus tutors, and increase the accuracy of the process evaluation of practical teaching. Promote the reform of practical teaching and improve the quality of practical education with management and evaluation.

4.3. Extracurricular learning

In view of the problems of students' weak extracurricular learning initiative, poor self-discipline and poor learning effect, on the one hand, intensify the reform of assessment and evaluation methods, continue to increase the proportion of process evaluation, and promote the transformation of students' learning behavior, on the other hand, strengthen students' after-school management and improve the effect of extracurricular learning through centralized self-study and extracurricular guidance.

5. Conclusion

Professional certification is the only way for normal majors to improve their expertise. According to professional certification standards, strengthening the effect of curriculum implementation is the key to promote professional certification. Enhancing the effect of curriculum implementation, continuously enhancing the training effect and quality of professional talents, and exploring a characteristic reform road with professional characteristics has a long way to go.

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References

- [1] Tuoyu Gu. Professional settings of local undergraduate normal colleges: Status quo, problems and adjustments [J]. Higher education exploration, 2020, (12):22-28.

- [2] Xiaochuan Zou, Jun Li, Qiang Lin. Exploration and practice of reform and innovation of applied talent training models in local colleges and universities [J]. Chemistry education
- [3] , 2017,38(16):14-18.
- [4] Xiao'e Wang. Exploring the Talent Training Model of Local Colleges and Universities under the Background of Transformation: Taking the Biological Engineering Major of Jilin Normal College of Engineering and Technology as an example [J]. Education and Teaching Forum, 2020, (51):44-45.
- [5] Lili Liu, Chao Lu. The history of teacher training certification in colleges and universities is inevitable and the system is optimized [J]. Teacher Education Research, 2019,31(05):40-45.
- [6] Wenhua Sun, Guidong Wang. Research on the construction of teacher training majors under the threshold of teacher training professional certification [J]. Journal of Shandong University of Technology (Social Science Edition), 2021,37(02):106-112.
- [7] Ying Sun, Mengting Geng, Feng Gao. Exploring the training mode of teacher training students' educational practice ability under teacher certification [J]. Chemistry education. 2015,36(12):39-44.