

# Study on the Current Situation of Skills Training for Pre-Vocational Chemistry Normal University Students Based on the Normal University Professional Certification

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**Abstract:** At present, the main task of normal universities is to train qualified teachers for primary and secondary schools. Thus, pre-service teacher skills training and some educational theories are compulsory courses for every normal university student. The level of pre-service teacher skill training of normal university students directly affects the future teaching work of students. Especially for chemistry normal university students, we should not only possess the basic teaching ability of teachers but also experimental operation skills. Therefore, transforming from an ordinary chemistry normal university student to a qualified chemistry teacher must go through many links, especially the pre-vocational chemistry normal university student skills training. Based on the relevant theory of the skill training of pre-vocational chemistry students, this paper combines its own practical experience and adopts the questionnaire method to analyze the problems existing in the skill training of pre-vocational chemistry students. This paper is divided into three parts, the qualities of the students, the current situation, and problem analysis.

**Keywords:** Pre-vocational chemistry normal university students; Normal university professional certification; Chemistry teacher skills training

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## 1. Introduction

With the development of society, the country pays more and more attention to the cultivation of talents, which cannot be separated from teachers. Therefore, the cultivation of teachers has always been a hot topic. It is particularly important to analyze and improve the pre-service teachers' skill training, so as to promote the construction of high-quality teachers and the process of teacher professional development.

## 2. Comprehensive quality and professional quality of pre-vocational chemistry normal university students under the background of normal university professional certification

### 2.1. Comprehensive literacy

In order to become a qualified middle school chemistry teacher, the comprehensive quality training of normal university students in normal colleges and universities mainly includes teaching pen and chalk writing skills, as well as Mandarin training, education information technology, speaking skills, and lecture skills <sup>[1]</sup>.

For chemistry teachers, Mandarin skills are crucial. Speaking Mandarin is the basis of oral expression skills training, which can further improve the level of Mandarin and directly affect the quality of knowledge transmission and the image of teachers; teachers' language should be scientific and standardized, clear, good at summarizing, and fluent in expression <sup>[2]</sup>.

Whether the writing of words is standardized is directly related to the education and teaching effect and the prestige of teachers. Especially when writing on the board, we should be skilled in the standard, symmetrical and beautiful, decent expression, smooth sentences, and writing a standard word.

The application of modern teaching resources has become increasingly extensive, interspersed with courseware teaching can stimulate students' interest in learning, but also can make students feel the content learned more intuitively. At this time, we need to know more about the use of the computer method, skilled in the application of information technology <sup>[3]</sup>.

### 2.2. Professional quality

The professional qualities that pre-vocational chemistry normal university students should train include introduction skills, language skills, blackboard writing skills, questioning skills, demonstration skills, and summarization skills (Table 1).

**Table 1.** Evaluation table of teacher skills training

Evaluation Form of Teacher Skills Training (Lecture)		
Project	Evaluation criterion	Ranking
Introduction skills	1. Clear direction	Outstanding
	2. Pay attention to connection	Good
	3. Communication between teachers and students	Average
	4. Pay attention appropriately to novel, unique, and positive energy	Pass
		Fail
Teaching language skills	1. The pronunciation is accurate, standard, clear and complete	Outstanding
	2. The volume is moderate	Good
	3. Rhythm is slow and moderate	Average
	4. The vocabulary and grammar are standard, accurate, insightful, easy to understand, and vivid	Pass
	5. The teacher's voice should be natural, moderate, and coordinated with the oral expression	Fail
Writing skills	1. Reasonable layout (main and sub-board writing)	Outstanding
	2. The project is clear, highly focused and enlightening	Good
	3. Neat, compact, clear, beautiful	Average
	4. The blackboard design is novel and creative, and can highlight the key and difficult points	Pass
	5. Writing is standard, no wrong words, with correct use of eraser	Fail

**Table 1. (Continued)**

Evaluation Form of Teacher Skills Training (Lecture)		
Project	Evaluation criterion	Ranking
Questioning skills	1. Introduce the problem is simple and clear 2. The questions raised should be suitable for the students' understanding level 3. Key content and keywords to slow down and increase the volume 4. Use questions to improve students' quality of listening	Outstanding
		Good
		Average
		Pass
		Fail
Demonstrate skills	1. Demonstrate the action specification 2. There should be moderate integration with the classroom teaching content 3. Demonstration should be combined with teaching, and we should be good at transforming students' perception into thinking activities	Outstanding
		Good
		Average
		Pass
		Fail
Summarization skills	1. Time is tight, and I can summarize the key and difficult points 2. Summary and promotion, should be combined with the actual chemical life has sublimation	Outstanding
		Good
		Average
		Pass
		Fail
General comment		

### 3. Current situation of teacher skill training of chemistry normal university students

#### 3.1. Problems existing in the micro-class teaching of normal university students majoring in chemistry

Through the questionnaire survey and analysis, we have analyzed many shortcomings in the skill training of pre-vocational chemistry normal university students<sup>[4]</sup>.

##### 3.1.1. Lack of understanding of micro-class teaching

Most of the teacher skills training courses for chemistry normal university students are concentrated in the third semester, with in-school lecture competitions in junior year and educational practice in senior year. Although micro-class teaching is inseparable from the skill training of normal students, many normal students do not know micro-class teaching at all<sup>[5]</sup>. In particular, the control of micro-class teaching time is not adequately managed. Typically, micro-classes require only about 10 minutes of content explanation, but some students prepare 40 minutes of content. Furthermore, there is often a lack of brief pre-class introductions, class questioning segments, and blackboard writing. Because micro-class teaching time is very short, the training focuses primarily on a few key areas. The integrity of the overall class structure should also be ensured<sup>[6]</sup>. Consequently, many normal university students interpret micro-teaching as short teaching content, with a strict time limit. As a result, some links and knowledge points are omitted in the teaching design.

##### 3.1.2. Lack of attention to micro-class teaching

Through the investigation, it was found that in many higher normal colleges and universities, many students

are participating merely to earn credits <sup>[7]</sup>. Without teacher supervision, some students will read through the courseware just to complete the class task. A few students, in order to pass the course, directly download courseware from certain software and then go through the motions in class. They do not even understand the specific content of each courseware, and their language is not fluent <sup>[8]</sup>.

### **3.1.3. Concentrated skills training courses for normal university students in different majors**

According to the survey, some teacher skills training courses in higher normal colleges are generally opened in the junior year, followed by limited micro-classes, so that the physics professional and chemistry professional normal university students attend classes at the same time and place <sup>[9]</sup>. This phenomenon is also inconducive to the teacher skill training of normal university students.

## **3.2. Teaching resources for teachers' skill training**

At present, some normal colleges still face the issue of staff shortages in teacher skills training courses. Specifically, there is a mismatch between the number of available teachers and the requirements of chemistry education courses. Unlike other classes, teacher skills training is a highly specialized course that requires significant teacher participation. A single teacher can tutor several students, but the tutor must have a comprehensive understanding of both middle school chemistry and middle school students. Otherwise, it is difficult to provide targeted training and achieve the expected training outcomes.

## **3.3. Problems existing in experimental teaching**

Chemistry is a subject based on experiments. As a future chemical worker, chemistry normal university students should not only have solid and comprehensive basic theoretical knowledge but also have a strong quality to conduct chemical experiments. It is particularly important to pass on the most practical and efficient experimental content to students in a limited time <sup>[10]</sup>.

The author investigated and analyzed the performance of chemistry normal university students in the middle school chemistry experiment teaching skills training, and found that the main problems are: (1) emotional tension and anxiety; (2) weak chemical knowledge in middle school; (3) weak experiment teaching skills; (4) improper experiment operation; (5) inadequate teaching preparation.

### **3.3.1. Emotional tension and anxiety**

When chemistry normal university students carry out experimental teaching and training, they conduct chemistry experiments as teachers. They should teach knowledge points while doing experiments, and no mistakes should be made in every link. This kind of situation is an unprecedented challenge for chemistry normal university students. Therefore, in the face of such a role change, many normal university students will be nervous, anxious, and incoherent in the process of teaching experiments.

### **3.3.2. Weak grasp of middle school chemistry knowledge**

Many normal university students show the phenomenon of weak basic knowledge in experimental teaching skills training. For example, some students cannot remember some chemical reaction phenomena, experimental precautions, the color expression of some salt solutions, or the writing of some equations. A knowledge point error will appear as a teaching accident. A good teacher should have a rich knowledge reserve.

### **3.3.3. Weak experimental teaching skills**

Questions arise during the question-asking session. For example, when talking about the "oxygen production"

experiment, small wood strips can be used in the last step of the oxygen test, some chemistry normal university students asked about the kind of wood strips to be prepared, showing that they lack understanding of the experiment <sup>[11]</sup>.

#### **3.3.4. Improper experimental operation**

Experiments are a means to learning chemistry. Middle school students are relatively unfamiliar with the operation of the experiment, so the teacher's words and actions will subtly affect the students. Thus, the teacher's experimental operation skills should be strong, but the experimental operation of many normal university students in experimental teaching is incorrect. For example, when disposing of the liquid, it is not handled according to the correct procedures in the book but is randomly poured into the beaker. The reagent label is not rinsed in the palm, the reagent bottle mouth is placed carelessly, the used beaker is not cleaned, and the test table is left insufficiently clean. The teacher's words and actions are critical. To become a qualified chemistry teacher, we should first regulate ourselves.

#### **3.3.5. Inadequate teaching preparation**

Due to insufficient preparation, there is a lack of an instrument or a certain medicine when carrying out the experiment, resulting in the experiment not being completed. Secondly, they did not consider the possible problems in the experiment during the lesson preparation, resulting in the breaking of test tubes, alcohol lamp fire, and lack of drugs in the process of the experiment <sup>[12]</sup>.

### **3.4. Problems existing in educational practice**

#### **3.4.1. Incorrect internship attitude**

When the intern first arrives at the internship school, they may not be given many teaching tasks or might be assigned to teach minor subjects. They may only teach two or three classes a week, leading them to feel that their internship work is neither valued nor important. As a result, they might not take the internship work very seriously. Additionally, some interns prioritize preparing for the postgraduate entrance examination over their internship duties. They might skip lectures at the internship school to focus on their exam preparation. While the postgraduate entrance examination is very important, we should also cherish every opportunity to gain teaching experience <sup>[13]</sup>.

#### **3.4.2. Lack of educational theory and weak professional knowledge**

All chemistry normal university students were exposed to a series of courses about educational theory, such as pedagogy, psychology, educational psychology, and chemistry teaching theory, but students often only rote to deal with the final exam and get credits, and do not really understand and master the knowledge of educational theory. Therefore, it is impossible to connect theory to practical teaching. Most interns do not inspire students well in teaching, and they cannot teach them in accordance with their aptitude. Whether it is new lessons, exercises, or experiments, they all use the same teaching method <sup>[14]</sup>.

## **4. Skills requirements for normal university students**

### **4.1. Employment status of students majoring in chemistry education**

Since chemistry is only started in the third grade, the demand for chemistry teachers is significantly lower than that of other disciplines. So as for chemistry normal university students, it is difficult to become a working teacher after graduation. On the one hand, there is a contradiction between the number of jobs and graduates;

on the other hand, there is a gap between the ability requirements for employment and the abilities of students in chemical education. From the current employment situation, it is clear that the expectations for students' thinking and practical skills do not completely align with employment requirements. While most graduates in chemical education pursue careers in education, some choose to work in chemical and pharmaceutical companies in roles such as product research and development or analysis. Additionally, a portion of students opt to pursue further studies, or careers as civil servants <sup>[15]</sup>.

## 4.2. Job placement skills requirements for students

In addition to possessing excellent quality and extensive chemical knowledge, teachers should also have skills in using Putonghua, standard chalk writing, information technology applications, chemical experiment operations, etc.

## 5. Conclusion

This paper focuses on the current state of professional certification in education, grounded in a firm policy basis for normal professional certification. It examines the status of skills training for professional chemistry teachers, adhering to the theory of teacher professional development. The goal is to promote reform in the teacher skills training system and ensure the quality of teacher education in normal colleges and universities. Pre-service chemistry teachers should adopt a correct attitude, and cherish and take seriously every skills training session for teaching methods. Given the current situation, it is essential to strive to become qualified teachers, as our future students are the pillars of the country. The key to pre-service chemistry teacher training lies in practice, understanding the connotation and generation of practical teaching wisdom, and advocating for the training of practical teaching skills.

To improve the current state of skills training for pre-service chemistry teachers and to train qualified teachers, as well as to provide a reference for future professional certification work, this paper innovates in theory, conducts investigation and analysis, identifies existing problems, and proposes several improvement measures for reference.

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