



A Probe into Mathematics Major Talent Training System under the Background of Teacher Training Professional Certification: A Case Study of Nanjing Xiaozhuang University

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Abstract. Under the background of teacher training professional certification, China has put forward more requirements on the cultivation of the practical innovation ability of normal students. Teachers should introduce the latest educational ideas into the classroom. Emphasize the role of students as the main body in practice. Introduce modern information technology into classroom teaching. Students should strive to improve themselves and constantly explore the path of self-development to become excellent teachers. Colleges should focus on practical innovation. Innovate talent training models to achieve the goal of high-quality talent cultivation.

Keywords: Teacher Training Professional Certification, Mathematics Major, Talent Training.

1 Introduction

Teacher training professional certification is an important measure to improve the quality assurance system and improve the quality of teacher education in our country. The purpose of teacher training professional certification is to ensure that the knowledge, ability and quality of teacher training graduates can meet the standards required for graduation, so as to promote the connotation construction of teacher training.[1] Professional certification refers to the specialized certification of professional education implemented by professional certification institutions, jointly carried out by specialized vocational associations and educators in the professional field, providing quality assurance for students to enter the vocational field of university education.[2] Since October 26, 2017, the Ministry of Education has launched the certification of teacher training majors in ordinary higher education institutions, pointing out the need to uphold the concept of "student-centered, output oriented, and continuous improvement", "guide universities to focus on the growth and development of teacher training students", and lay a solid foundation for the overall quality improvement of the basic education teacher team.[3] Its concepts are Student-Centered (SC), Outcome-based Education (OBE) and Continuous Quality Improvement (CQI).

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Teacher training certification adheres to the "people-oriented", and puts forward clear requirements for the training objectives, graduation requirements, courses and teaching, cooperation and practice, teaching staff, support conditions, quality assurance and student development of normal majors in colleges. Article [4-7] has done related research from the aspects of characteristic curriculum system, training goal reform countermeasures, talent training program, assessment and evaluation analysis from the STEM education concept and OBE concept respectively. Through professional certification, colleges and universities can adjust and optimize mode of teacher education majors and improve the quality of talent training. It can promote colleges and universities to formulate scientific and efficient learning programs based on students' professional and development, so as to shape excellent normal students with real ideals, responsibilities and hardships.

2 Case Analysis

2.1 Questionnaire Survey

The purpose of this research is to address the following questions: Does the school have any issues with talent cultivation under the background of teacher training certification? What is the problem if it exists? How to solve it? Based on the questionnaire designed by Wen Ping [8] and He Kerong [9], 1010 senior students of Nanjing Xiaozhuang University were selected as the survey objects. The survey includes 13 questions, covering three aspects: talent cultivation, curriculum development, and educational practice.

The questionnaire questions include:

- (1) Have you passed the Mandarin test? A. Yes B. No
- (2) What kind of internship did you participate in? A. Centralized internship in the school B. Dispersed internship in the school C. Independent internship D. Other
- (3) Have you ever been absent or missed during your internship? A. Yes B. No
- (4) Are you familiar with the course standards of the textbook during your internship? A. Very familiar B. Relatively familiar C. familiar D. not familiar
- (5) Do you feel that the major courses in the school are helpful to you during the internship? A. Very helpful B. Relatively helpful C. helpful D. not helpful
- (6) Are you satisfied with the final internship criteria? A. Very satisfied B. Somewhat satisfied C. satisfied D. dissatisfied
- (7) Have you learned how to use smart blackboard, electronic whiteboard and other teaching equipment in school? A. Yes B. No
- (8) How many professional courses did you take in a week at school? A. Verses 1-2 B. Verses 3-4 C. Verses 5-6 D. Verses 7-8
- (9) How many courses on curriculum and pedagogy did you have in a week at school? A. Verses 1-2 B. Verses 3-4 C. Verses 5-6 D. Verses 7-8
- (10) How many professional skills courses did you have in a semester when you were in school? A.0 sections B.1-4 sections C.5-8 Sections D.8 and above
- (11) What was the style of teaching during your time at school? A. Chalk B. Electronic screen C. Educational platform D. Other

(12) Do teachers update educational resources in a timely manner? A. often B. occasionally C. never

(13) Have you passed the Teacher training professional certification examination? A. Passed B. Failed

Table 1. Statistical table of questionnaire results for Teacher training professional certification (%).

Q	1	2	3	4	5	6	7	8	9	10	11	12	13
A	92.1	2	89.3	2.0	4.2	2.2	59.8	3.2	85.2	59.6	86.5	20.8	68.3
B	7.9	0	10.7	4.5	9.8	15.8	40.2	7.9	12.8	40.4	7.0	72.1	31.7
C	0	98.0	0	8.9	40.8	18.4	0	21.4	2.0	0	6.5	7.1	0
D	0	0	0	84.6	45.2	63.6	0	67.5	0	0	0	0	0

Based on the analysis of Table 1, the findings are as follows:

Satisfaction with talent training.

The talent training module of the questionnaire includes questions (1), (6) and (13), which mainly involve the passing rate of Mandarin, the passing rate of teacher qualification certificate and the satisfaction with school internship judgment standards. The purpose is to try to find out whether normal colleges have an impact on talent training under the background of professional certification of normal college students. In the survey results, it can be found that the passing rate of students' Putonghua is 92.1%, the passing rate of teacher qualification certificate is 68.3%, and the satisfaction rate of school internship criteria is 40.8% and 45.2%. It is found that most students have passed the Putonghua level examination, but the passing rate of teacher qualification certificate is far below the expectation. And nearly half of them have doubts about the school internship judgment.

Course offerings.

The course offering module of the questionnaire include questions (7), (8), (9), (10), (11) and (12), which mainly involve whether they have learned the use of relevant teaching AIDS in school. Understand the number of courses for course training, specialized courses, educational specialized courses, and microtraining courses. The purpose of this is to analyze whether the distribution of courses in normal colleges is reasonable under the background of normal professional certification. Will there be favoritism? Can it assist students in their future employment? In the survey, it was found that 67.5% of students have 7-8 professional courses per week; 85.2% of students have 1-2 educational courses per week; 59.6% of students even do not have microtraining classes, while 40.4% of students have 1-4 sessions. The proportion of professional courses far exceeds that of educational professional courses, and the proportion of micro training courses is not high.

Educational practice.

The educational practice module of the questionnaire includes questions (2), (3), (4), and (5), which mainly involve the form of practice, the absence of positions in practice, the familiarity with curriculum standards in practice, the connection between practice and school teaching, and the teaching equipment of internship schools. The purpose is to explore the quality of the practice situation under the background of teacher training certification and find out its impact on the development of normal college students. It was found in the survey that 89.3% of the internship vacancies occurred during the

situation, this data should be paid attention to. During the internship, 84.6% of the students chose to be unfamiliar with the curriculum standards, and the proportion of unfamiliar students was too high. The students who think that the internship and the school's teaching courses are helpful and not helpful are equally divided.

2.2 Existing Problems

As an applied major, the teacher's major not only needs to reflect the professional courses of the subject, but also needs to be closely combined with the education profession. The existing training mode of teachers' major in normal colleges can be roughly divided into two parts: "traditional curriculum and skill practice" [10]. Traditional courses include subject courses, activity courses, skills courses, professional courses, etc. For teacher training students, apart from the compulsory thinking courses and physical education courses for college students, professional courses and teacher professional courses occupy the main part, and teacher professional courses include three characters, Mandarin training, multimedia practice, microtraining, etc. Skills practice mainly includes course internships, professional internship, graduation internships, job internships, etc. It is practical operation practice in addition to simple training of traditional courses in ordinary classes, and it is an extension of traditional courses and an extremely important part of normal university students' education.

However, Teacher training professional certification is still in the early stage, "Teacher training professional certification and teacher professional access and withdrawal mechanism is not perfect, there are illegal parts." The construction of teacher training specialty lacks the support of documents and rules and regulations for reference. Professional certification standards for teachers are mixed." [11] There are too many related interests involved, and it is difficult to change in the short term, resulting in difficulties in promoting education. There is few suggestions on professional development. The threshold for participation in teacher training certification is low. The standard for determining the professional certification of teachers does not consider the educational needs of each region, so "excellent certification does not necessarily produce excellent students. The effectiveness and correctness of relevant policies need to be considered." [12]

In the survey, it was found that there were loopholes in the field of internship. For example, in the independent practice, the authenticity of the practice and the accuracy of the results cannot be fully guaranteed. This will lead to inaccurate evaluation of internship results by relevant institutions. It will also reduce the student's gain in practice. Based on the investigation, it is found that the teaching methods in colleges and universities are relatively simple, and the teachers' research on basic education is not thorough enough. Most of the students in school use traditional teaching methods in skill training, and the teaching methods are relatively backward. The traditional curriculum is mainly taught by teachers, which can not be well integrated with the current scientific and technological development, so that students will have a negative impact on accepting new things. Normal students usually lack group cooperation, case analysis and other teaching methods, unable to deeply understand the content and essence of teaching,

teaching skills improvement is relatively slow. With the gradual improvement of China's infrastructure construction, most areas have adopted advanced multimedia teaching technology and teaching methods. Normal students are not familiar with advanced science and technology, which will lead to a prolonged adaptation period. After the professional certification of teachers, some colleges and universities may have a long-term situation of complacency. Students subconsciously think that gaining social approval is easy. Only 68.32% of the students in the survey obtained a teacher qualification certificate. Only a small part of the students who did not get the certificate did not pass the exam because of their lack of ability, but most students did not pay enough attention to it. The lack of motivation in the innovation of the teaching system and the failure to find out the deficiency in time is detrimental to the long-term healthy development of colleges and universities.

3 Reform Strategies for the Training Mode of Teacher Trainees under the Background of Teacher Training Professional Certification

The reform of the training mode under the background of teacher training certification is a necessary transformation. According to the analysis of the results of the questionnaire, the college can improve from three aspects, such as talent training, course opening and educational practice, so as to make the curriculum more reasonable and teaching more compatible with modern science and technology.

3.1 Gradually Improve the Professional Training System with Clear Goals

Universities should deeply implement the certification and training standards for teacher training majors, and formulate more targeted training goals based on the graduation requirements of teacher trainees. In order to solve the problems existing in the curriculum system and training mode of the mathematics teacher major, the mathematics major has organized teachers to listen to expert opinions and on-site discussions for many times. Nanjing Xiaozhuang University actively explores the development path suitable for its mathematics teaching major under the index system of teacher professional certification. Under the premise of ensuring that students can master basic scientific knowledge and develop basic skills in an all-round way, the College makes an in-depth analysis of the teaching objectives, teaching contents, teaching methods and evaluation methods of teacher education courses and mathematics professional courses, and selects high-quality teaching materials and teaching resources suitable for mathematics education needs. The mathematics major conducts practical training for students at regular stages, adjusts the problems that may occur in the training of normal college students at any time, and emphasizes the pertinency and detail of training goals. Professional courses and normal courses are combined to integrate in-class practice and extracurricular practice to ensure students' professional quality. The characteristics of vocational ability in the goal of talent training need to be realized through the curriculum system and teaching activities. Different course objectives will support the target

points required for graduation. Therefore, we must reverse design the curriculum system and improve the talent training target plan based on graduation requirements.[13]

3.2 Putting Students at the Center, Innovating and Reforming Curriculum Teaching

The teacher training certification clearly points out that the certification implements the OBE education concept, that is, the results-oriented education concept, adheres to the student-centered, and adopts reverse thinking to construct the student training model. The cultivation of normal students mainly comes from the study of various professional courses, which focus more on "professional disciplines" and neglect "normal teaching". Due to the limited opportunities for training in normal universities, their professional skills cannot be developed. Curriculum setting should be bold innovation, starting from the training goal, "actively try to combine the curriculum system with the cutting-edge knowledge, keep up with the pace of the times, ensure that students accept the scientific and rapid iteration of knowledge, can adapt to the needs of future jobs, relevant training teachers should also hold regular meetings, timely exchange and update teaching experience"[14], choose suitable courses, give them more opportunities to practice exchange learning, and help them find jobs in the future. Teachers should implement curriculum objectives when carrying out teaching activities. By building a "first-class curriculum", the focus is on what students "learn". In the continuous reform of teaching activities and the improvement of curriculum system, curriculum objectives can realize the support of graduation requirements.[15]

3.3 Develop the Corresponding Professional Platform and Enrich the Practical Teaching Resource Base

With the support of professional certification resources for teachers, the mathematics major of Nanjing Xiaozhuang University has developed a professional network communication platform with its own characteristics. Through big data analysis, timely understanding of each student's educational development. The college constructs the resource teaching website Blackboard to realize the sharing of educational resources. The College organizes online mathematics teaching training in a timely manner to enrich teachers and students' teaching and learning and provide opportunities for teachers and students' ability development. Mathematics normal university students can make full use of resources, pay more attention to the new education platform and new teaching software, connect educational resources with information and digital, and broaden the scope of knowledge. Normal university students can try to participate in the research and development of mathematics teaching content and the construction of teaching resources. The abundant platform resources provide students with ample opportunities to choose the appropriate form of education for themselves.

3.4 Comprehensively Carry Out Discipline Competitions to Improve Teaching Skills

Nanjing Xiaozhuang University has held many skills competitions for normal students, such as three-stroke characters, poetry recitation, and classroom practice. The college actively leads students majoring in mathematics to participate in national, provincial and municipal discipline competitions and normal university student skills competitions. The college has won the first prize in the competitions for many times. Cultivate the ability of active thinking, unity and cooperation in a harmonious competitive environment. Through the competition, normal university students can accumulate teaching experience and accelerate the process of realizing role transformation.

3.5 Cultivate the Soul of a Teacher and Keep It in Mind

"Education is the top priority for the nation. It is necessary to shoulder the heavy responsibility of the times, cultivate morality and cultivate people "[16], Just as the motto of Beijing Normal University says: "learning is a teacher, behavior teacher. "Under the background of professional certification of teachers, the mathematics major of Nanjing Xiaozhuang University takes moral cultivation as its fundamental task and adheres to Mr. Tao Xingzhi's educational concept of "integration of teaching and doing". In order to adapt to the requirements of the reform and development of middle school mathematics education in the new era, based in Nanjing, serving Jiangsu and radiating the whole country, we strive to train backbone teachers with noble ethics, solid knowledge and innovative spirit of mathematics, who are competent for middle school mathematics teaching and teaching and research.

3.6 Implement Teaching Practice to Improve Teaching Strength

Normal university students in addition to the theoretical knowledge of education, but also have a strong teaching ability, as the ancients said, "the paper is shallow, never know this matter to practice." Theoretical knowledge is to provide a solid ideological foundation for our education students and self-development. Teaching skill is an important criterion to measure whether normal university students can become qualified teachers. "Teacher training professional certification has made corresponding regulations for the internship location, time, and assessment standards of teacher training students, which can effectively ensure their effective participation in educational practice and exert their subjective initiative. As teacher training students, we should fully utilize the professional certification resources of teacher training students and strive to improve our professional abilities." [17]. In junior and senior years, the mathematics major of Nanjing Xiaozhuang University will organize students to observe the classes of outstanding teachers, learn their teaching style, communication with students and problem-solving methods. In the process of practice, normal university students can establish a good relationship with the instructor and do a good job as a small assistant to the

instructor. The mathematics major of Nanjing Xiaozhuang University provides free tutoring services for surrounding primary and secondary schools during winter and summer holidays every year to exercise students' teaching ability.

4 Conclusion

The certification of teacher training majors is undoubtedly a significant educational reform for teacher training colleges and students. It maintains a virtuous circle of education. We should implement practical and effective strategies to promote the healthy and sustainable development of education through the certification of teacher training majors.

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