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Research on the Teaching Design Ability of Mathematics Normal Students in Local Normal Universities in China

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Abstract
In order to ensure the smooth development of future work, normal university students must constantly improve their ability of teaching design. This paper uses text analysis method to study the teaching design ability of mathematics normal college students. This paper investigates the mathematics teaching design ability of normal university students from six aspects: overall teaching design, teaching objectives, key points and difficult points of teaching, teaching process, homework arrangement after class and teaching reflection. The results show that the students' overall understanding of teaching design is slightly biased, and the ability of compiling teaching objectives is not ideal, they are able to grasp the key and difficult points in teaching, but unable to put forward how to deal with the key and difficult points in teaching; The teaching process design is also deficient; Normal university students do not pay attention to homework assignment and teaching reflection. Finally, the paper puts forward some suggestions on the development of teaching design ability of mathematics normal university students.

Keywords: Normal mathematics student; Teaching design ability
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1.Introduction

The professional development of teachers has always been the focus in the field of education. The important manifestation of teachers' specialization is the ability of teaching design, which occupies a very key position in teachers' teaching ability. The Educational Technology Competence Standard for Primary and Middle School Teachers (Trial) puts forward requirements for teaching staff's teaching design ability: Be able to compile correct teaching objectives, seriously deal with the teaching content, consider students' ability, and carry out teaching activities in a reasonable teaching environment[1]. Normal school students are the reserve force of teachers. A wonderful class is inseparable from accurate and ingenious teaching design. The Professional Standard for Middle School Teachers (Trial) issued by the Ministry of Education in 2012 puts forward specific requirements for teachers' teaching design: scientific teaching objectives; make full use of teaching materials and teaching methods; guide students to design their own learning plans[2]. Under the background of teachers' professional development, only normal school students have excellent teaching design ability can they work more effectively in the future.

2. Literature Review

2.1 Mathematics Teaching Design

Currently, there is almost no unified definition of mathematics teaching design, but most researchers have the same understanding of this point.

Xi Dinghua supported that mathematics teaching design is a teaching process in which teachers determine teaching objectives by analyzing teaching materials and learning conditions on the basis of learning relevant theories of mathematics teaching[3]. In Middle School Mathematics Teaching Design, He Xiaoya and Yao Jing expounded that students' current cognitive level should be fully taken into account in teaching design, and then design appropriate teaching objectives, carefully design teaching links, and organize teaching content reasonably[4]. Fang Junbin and Jiang Zhiping held that when designing teaching, mathematics teachers should consider the differences of students and the requirements of current education for mathematics teaching, design teaching plans by appropriate methods on the basis of learning relevant teaching theories and their own understanding of mathematics, and make teaching evaluation and reflection after teaching practice[5].

There are generally two kinds of mathematics teaching design. One is the teaching design of mathematics

curriculum, which is designed on the basis of mathematics teaching materials and teaching objectives in middle school, and its scope is relatively extensive; the other is mathematics classroom teaching design, which is very specific and pays attention to the detailed design of the teaching of each knowledge. It is worth explaining that this study only deals with the mathematics classroom teaching design ability of mathematics normal students.

2.2 Normal College Students' Ability of Teaching Design

Instructional design ability is a professional skill that teachers must master, which mainly refers to the ability system to make decisions and standardize the teaching activities of the teaching system with modern education as the core and by the way of instructional design[6]. As for the teaching design ability of normal school students, Xu Xuelian and Fan Xiaoming reported that "this is the ability to combine their own teaching practical experience with the teaching theories they have learned, and to be able to apply these flexibly to their own teaching design. Teaching design includes teaching goal design, teaching key and difficult point design, teaching method design, student learning activity design and teaching process design. [7]" Luo Xiaodan considered that the teaching design ability of normal school students is mainly their ability to design and organize teaching in the classroom, in other words, the ability of normal school students to transform the specific teaching process of the classroom into teaching design[8]. Li Yan and Yang Kun clarified that everyone's instructional design ability is different, for example, some people are better at dealing with knowledge, some people are more prominent in skills, some people are emotionally engaged, etc. All of them can effectively complete the instructional design on top of their own advantages[9].

According to the literature review, there are not many scholars who pay attention to the teaching design ability of normal school students, and the special research on the teaching design ability of mathematics normal school students is even more lacking. Accordingly, this work focuses on the juniors majoring in mathematics, and carries out research from the following six aspects: the overall understanding of teaching design, teaching objectives, teaching difficulties, teaching process, after-class assignment and teaching reflection, and thus, providing effective suggestions for the development of normal school students' teaching design ability.

3. Research and Design

3.1 Research Object

A total of 170 normal students majoring in mathematics education from a normal university in a coastal city in eastern China were studied. They came from four classes of the same grade of junior and senior respectively. Currently, they have studied the basic courses of mathematics teaching in middle school, such as mathematics teaching theory, middle school mathematics curriculum standards and teaching materials research, teachers' professional ethics and educational policies and regulations, mathematics history and other courses related to mathematics teaching. Fundamentally, they have not yet participated in the internship practice, so they do not have rich practical experience.

3.2 Research Content

In this work, the mathematics teaching design ability of normal school students is investigated from six aspects: overall understanding of teaching design, teaching objectives, teaching difficulties, teaching process, after-class assignment and teaching reflection. Subsequently, some meaningful suggestions are put forward for the development of instructional design ability through the analysis of the research results.

3. 3 Methodology

The method of main text analysis is adopted. At the beginning, the general structure of the analysis of normal college students' instructional design ability was formed by reading a large number of related literature, and the dimensions of the analysis were divided. Then, it is determined to study the mathematics teaching design ability of normal school students from six aspects: overall understanding of teaching design, teaching objectives, teaching difficulties, teaching process, after-class assignment and teaching reflection. Finally, the normal students' instructional design text was collected as the content of text analysis, and the students completed the task of instructional design within the specified time in class. During this period, they are allowed to consult teaching materials and Internet materials.

4. Research Results

A total of 170 instructional designs were collected, of which 164 were effective designs, with an effective rate of 96.5%. Among them, the theme of normal school students' teaching design is Unary First Order Equation, which is the content of the first volume of the seventh grade mathematics textbook of the people's Education Edition. Unary first order equation plays an important role in junior high school mathematics knowledge, and it is the basis of univariate quadratic equation and other knowledge. At the same time, there is a close relationship between equations and functions and inequalities, which plays a key role in mathematics learning.

4.1 Normal College Students' Overall Understanding of Instructional Design

Mathematics normal school students' understanding of instructional design as a whole has been preliminarily understood after carefully reading 164 effective instructional designs.

Table 1 Overall Understanding of Instructional Design

Content	Questions	Items	Frequency
The overall understanding of instructional design	What is instructional design?	The process of writing a lesson plan	39
		The process of interaction between teachers and students	31
		The process of formulating a plan to solve teaching problems	94
	What is the teaching subject?	Teachers	11
		Students	132
		Teachers and students	21
	Is the instructional design complete?	Analyze learning tasks and determine teaching objectives	118
		Grasp and Analysis of important and difficult points in Teaching	157
		The teaching process is basically complete	122
		The homework after class is arranged in detail	23
		Reflection on teaching after class	19

In the understanding of instructional design, 24% of people think that it is "the process of writing a lesson plan", 19% think it is "the process of interaction between teachers and students", and 57% think it is "the process of making solutions to teaching problems". Teaching design is not a lesson plan, but a changeable process. In the process of teaching, teaching should be carried out according to the students' immediate feedback in class.

Among the 164 teaching designs collected, 11 normal school students reflect that the teacher is the main body of teaching in the teaching design, and 132 normal school students reflect that the students are the main body of teaching in the teaching design, while the remaining 21 studetns regard teachers and students as the masters of the classroom, indicating that it is in line with the requirements of the curriculum standard to regard students as subjects in teaching.

According to the collected instructional design, most people's instructional design is basically complete. Among the 164 teaching designs, 118 mathematics normal school students can analyze learning tasks to determine teaching goals, 157 mathematics normal school students can grasp and analyze the important and difficult points of teaching, and 122 mathematics normal school students' teaching process is basically complete. However, in the part of homework assignment, only 23 mathematics normal students can make detailed arrangements, and only 19 normal school students can reflect after class.

In a word, most mathematics normal students can present a relatively complete teaching design of Unary First-Order Equation, and can also correctly grasp the teaching role of teachers and students in teaching. Unfortunately, the instructional design of a small number of mathematics normal students is relatively scribbled. Obviously, some mathematics normal students do not have a correct attitude towards instructional design writing. There are challenges of diversification, but those normal school students who have no internship experience still have plenty of room for improvement.

4.2 Normal College Students' Understanding of Teaching objectives

The curriculum reform of compulsory education in China emphasizes that students' learning goals should not be limited to knowledge and skills, the development of their ability and literacy in the learning process, and the changes of emotion, attitude and values also occupy an essential position in teaching[10]. This implies that attention should be paid to the setting of three-dimensional goals in the goal determination of instructional design. Generally, three-dimensional goals include: (1) knowledge and skill goals: understand the definition of equations and unary linear equations; (2) learn to transform practical problems into mathematical problems, determine the quantitative relations in mathematical practical problems, and list equations to solve practical problems through quantitative relations; and (3) emotion, attitude and values goal: realize the application value of mathematics and explore more possibilities in mathematics on the basis of establishing equation model to solve practical problems.

The mathematics normal school students' understanding of the teaching objectives was preliminarily understood after reading 164 effective teaching designs.

Table 2 Analysis of The Understanding of Teaching Objectives

Content	Questions	Items	Frequency
Analysis of The Understanding of Teaching Objectives	Is it necessary to use three-dimensional goals when designing teaching goals?	Yes	155
		No	9
	Are three-dimensional objects independent or integrated?	Independent	39
		Integrated	109
		Unclear	16
	Which of the three-dimensional targets is analyzed more accurately?	Knowledge and skills	149
		Process and method	101
		Emotional attitudes and values	86

According to the above table, the teaching goal-setting ability of mathematics normal students is relatively good, because most normal students can write teaching goals very well. It is clear that they can write knowledge and skills more accurately, which fully reflects their ability to grasp the key knowledge in books, but their ability to write goals in the other two areas obviously needs to be strengthened.

Teaching goal is an indispensable part of teaching design, because it is the teacher's requirement for the result of teaching work, which is divided into three dimensions. The above table indicates that 66% of the math normal students' three-dimensional goals are integrated, 24% are independent of each other, and 10% are confused. This suggests that most mathematics normal school students have the ability to design better teaching goals in teaching design. Mathematics normal students understand that the three-dimensional goals should be integrated, but some people's grasp of the teaching goals is not accurate because they can not accurately and effectively understand. Fortunately, most mathematics normal students can integrate them organically when working out their teaching goals.

When writing 3D goals, the most important thing is to integrate them organically, so how to achieve them? Before writing these three goals, it is necessary to understand that they must be related to each other, as a whole, and each goal should be specific, not general; secondly, it is necessary to make progress between them when writing them, which will enable the writers to grasp the three-dimensional goals as a whole, so that the goals can be better integrated. Finally, the writers should also develop their own ability, because there are always some unexpected situations in the teaching process that lead to the deviation of the results and fall short of the initial goal. These indirectly imply that the relevant knowledge should be used flexibly in the classroom and enable students to develop closely around the three-dimensional goals.

Among the three-dimensional goals, 149 mathematics normal students can accurately compile "knowledge and skills", 101 mathematics normal students can accurately compile "processes and methods", and 86 mathematics normal students can accurately compile "emotional attitudes and values". Obviously, most of the mathematics normal students can work out the three-dimensional teaching goals according to the relevant teaching contents of the unary first-order equation.

There are also some challenges in compiling three-dimensional teaching goals. Some mathematics normal students can not make it clear that the main body of the teaching goal is the students, and the teaching goal should start from the students and point to the basic idea of the students. As a result, they have the misrepresentation that "students are required to understand the concept of unary first-order equations" when writing goals. "Process and method" is a procedural goal, and its action verbs are experience, adoption, analysis, discovery, etc., but there are no action verbs in writing this goal, on the contrary, it is still commonly used to "understand the concept of unary first order equation". Their compilation of the teaching goal of "emotional attitudes and values" is not accurate enough, which is an experiential goal and the feeling gained through a series of learning experiences. Almost all the normal school students write the content of "stimulating interest in learning", but the essential characteristics of the unary first-order equation are not highlighted at all.

On the whole, mathematics normal students can write the goal of "knowledge and skills" in accordance with the requirements of the curriculum standard, while the other two goals are generally written. The mistakes made by most mathematics normal students are similar and simple, which suggests that the instructor should put forward the emphasis in this respect, and the students will inevitably make a qualitative leap in the formulation of three-dimensional goals.

4.3 Analysis on The Understanding of Important and Difficult Points in Teaching

Students have basically dabbled in some knowledge of the equation before learning the unary first-order equation, and can determine the equivalent relation from the specific problem, and then list the equation.

Moreover, in primary school, they have learned to use the properties of equations to solve general equations, and have mastered a lot of knowledge about equations, but they do not involve the concept of unary first-order equations.

In the following text, the key and difficult points of the unary first order equation is designed according to the relevant requirements of the curriculum standard. Key points: determine the equivalent relationship after thinking about the problem, and then write the equation through the equivalent relation, and finally summarize the concept of unary first-order equation by analyzing the relevant characteristics of the equation. Difficulty: Obtain the concept of univariate first-order equation by analyzing and discussing the common characteristics of multiple equations.

The mathematics normal students' understanding of the important and difficult points in teaching has been preliminarily understood after reading 164 effective teaching designs.

Table 3 Overall Understanding Of Instructional Design

Content	Questions	Items	Frequency
Overall Understanding Of Instructional Design	Can the specific key points of students' learning be accurately grasped?	Yes	102
		Basically	57
		No	5
	Can the specific difficulties of students' learning be accurately mastered?	Yes	87
		Basically	59
		No	18

According to 164 teaching designs, most of the mathematics normal students have a clear grasp of the important and difficult points, and basically meet the requirements of the curriculum standard. However, most normal school students can not put forward the relevant teaching methods to overcome the important and difficult points in the follow-up teaching process. It is considered that this is also an important problem for mathematics normal students at present.

4.4 Analysis of the Understanding of The Teaching Process

The unary first-order equation enables the connection between primary school mathematics knowledge and junior high school mathematics knowledge. Before learning the unary first order equation, students always choose the arithmetic method to solve the actual mathematical problem. When learning mathematical knowledge in primary school, they can express the quantity in the actual problem through the unknown number, and then express the equal quantity relation in the actual problem. But not all students are adept at expressing equivalents with expressions containing unknown numbers, so it is impossible for them to fundamentally replace arithmetic with algebraic methods. Therefore, teachers should actively guide students to change their thinking and think deeply about the problems raised in the teaching process of unary first order equation. They usually solve the problem of the distance of buses and trucks by arithmetic, but they will identify that it is troublesome to use this method, which suggests that it is necessary to stimulate students to think about new methods and further discover new knowledge hidden in mathematics. Then, the students are asked to determine the equivalent relation in the problem, express the unclear quantity with unknown numbers, and then list the equation, and summarize the concept of unary first-order equation through this process. Finally, it is concluded that the algebraic method is a common method to solve practical problems, that is, the equation is listed by the equivalent relation.

The normal school students' understanding of the teaching process was preliminarily understood after reading 164 effective teaching designs.

Table 4 Understanding of The Teaching Process

Content	Questions	Items	Frequency
Analysis of the understanding of the Teaching process	Is the teaching process complete?	Yes	143
		No	21
	Is it possible to design appropriate activities for teachers and students according to the teaching content?	Yes	43
		Basically	93
		No	28
	Can enlightening questions be raised in teaching tasks?	Yes	32
		Basically	97
		No	35
	Do the questions and thoughts of the setting give the corresponding results?	Yes	58
		No	106

It can be seen from the table that 87% of the mathematics normal students can arrange the teaching links completely, and 13% of the mathematics normal students' teaching process is incomplete, so it can be seen that most of the mathematics normal students can arrange reasonable teaching links. According to statistics, the teaching design mode of most mathematics normal students is mainly as follows: problem introduction-new method solution-summary concept-practice consolidation-classroom summary-homework assignment.

In particular, we should make full use of the practical mathematical problems of buses and trucks in the link of problem introduction. According to the analysis of the collected instructional design, it is clear that most mathematics normal students start teaching with the problem of bus and truck driving distance in books, and allow students to use their familiar knowledge to solve this problem, even with the most common arithmetic methods. In the next step of the solution of the new method, the question is asked: is there any other way to solve this problem? This indirectly reminds students of the knowledge of equations, which enables students to use algebraic methods to solve bus and truck problems. These two links allow students to summarize the advantages and disadvantages of using arithmetic and algebraic methods respectively. The arithmetic method can be used in most mathematical practical problems, which means that its scope of application is relatively broad, but it is quite troublesome to use this method in meeting some mathematical problems with unknown quantities. Algebraic methods can make up for this defect. Obviously, it is more convenient to use equations in solving practical problems. In the next few links, most of the normal school students are more or less the same, defining equations and univariate first-order equations, consolidating exercises, summarizing and assigning homework.

In designing the activities of teachers and students, 43 mathematics normal students can design appropriate ones, 93 can basically complete them, and 28 can not meet the requirements, indicating that most people can still have the ability in this aspect. Most of the mathematics normal students can connect each link in the teaching design, and design the teaching problems related to each link, so that the students can keep up with the pace of teachers and think about problems and start learning together. In this process, most mathematics normal students give full play to their protagonist consciousness in the process of instructional design, that is, let students occupy the dominant position in the learning process. For example, when thinking about the problems of buses and trucks, let the students think about using different methods to solve the problem; let the students summarize the learning content of the one-dimensional equation class, etc.

In terms of design enlightening problems, 32 students can complete it, 97 can basically complete it, while 35 can not, indicating that most people are good at this aspect. Questions that inspire students to think should be put forward in class, because it can encourage students to actively join the classroom, keep up with teachers' thinking, make progress together, and achieve teaching goals. For example, what's the difference between using arithmetic and equation methods to solve problems? Students will understand that in arithmetic methods, only known numbers can participate in the calculation, but it is troublesome to solve this problem through enumerations when there are unknown numbers in the problem. In the algebraic method, the quantity involved is not only known, but also unknown. Combined with the equal relation in the problem, it can be found that the relationship between the known quantity and the unknown quantity, which can better help us to solve the problem. Therefore, it is very important to learn to solve problems with equations, that is, algebra, because it perfectly reflects the necessity of continuing to learn mathematics, which is also a great progress in mathematics from equations to equations.

4.5 Analysis on The Understanding of Homework Assignment After Class

In July 2021, the opinions on further reducing the burden of students' homework and out-of-school training in compulsory education issued by the General Office of the CPC Central Committee and the General Office of the State Council put forward higher and stringent requirements for teachers' homework assignment. It requires that the homework assigned by teachers should not only meet the requirements of curriculum standards and teaching materials, but also refer to the learning differences among students. Students with learning difficulties should be assigned basic assignments, while students who have more than enough to learn should be assigned expansive assignments. The forms of homework should be various, such as thinking homework, practical homework, written homework and other forms, so that students can experience the joy of learning in the homework. Additionally, the total amount of after-class homework should be controlled within a certain range, and the whole after-class exercise should not be assigned as homework, so as to reduce the learning burden of students; assignments should be carefully compiled, so as to make rational use of teaching auxiliary materials, there should be no rare questions, strange questions and too difficult questions.

Table 5 Understanding Of Homework Assignment After Class

Content	Questions	Items	Frequency
Understanding Of Homework Assignment After Class	Is homework assignment included in the instructional design?	Yes	120
		No	44
	Problems in homework assignment (120 instructional designs for homework assignment).	The form of homework is rigid and rigid	97
		The difficulty is unified and the pertinence is not strong	10
		I can't grasp the amount of homework after class	107
	The advantages of homework assignment (120 instructional designs for homework assignment)	There are various forms of homework, and the development of thinking is involved	18
		Control the amount of work	13
		Pay attention to the gap and potential of students	23

Mathematics normal students' understanding of homework assignment was preliminarily understood after reading 164 effective teaching designs. According to the analysis, among the 164 teaching designs, only 120 mathematics normal students assigned after-class homework, and the remaining 44 mathematics normal students did not mention it, and 97 of the 120 mathematics normal students have simple assignments without thinking, but blindly require students to complete after-class exercises. Generally, only 23 mathematics normal students have completed the after-class homework assignment seriously, indicating that most of the normal school students do not pay attention to the after-class homework assignment.

Although only 23 mathematics normal students have completed the after-class homework assignment seriously, there are also some problems. There are 10 mathematics normal students assigned homework in various forms and related to the development of thinking, but can not control the total amount of homework, too many homework questions, which will undoubtedly bring significant homework pressure to the students. The remaining 13 normal math students have done a good job in homework assignment and can assign after-school homework in accordance with the relevant requirements of the double reduction policy.

It is understood that the vast majority of mathematics normal students do not want to spend some thought on homework assignment and do not realize the importance of after-class homework. Therefore, it is suggested that they should strengthen their learning and thinking in the assignment, design and arrange the homework that meets the requirements of the double reduction policy, and give full play to the role of after-school homework, so that students can be effectively improved.

4.6 Analysis of the Cognition of Teaching Reflection

The purpose of this section is to enable students to understand the equation and the unary first order equation, and to pay attention to the advantages of expressing numbers in letters in the process of teaching, and to solve the problem by finding equations with equal relations. In fact, the concept of equation appeared in the learning of mathematics in primary school. On this basis, how to enable students to understand and use equations at a higher level according to their existing knowledge? This is what we should focus on in this lesson. Specifically, some open teaching designs are consulted on the Internet and a more effective teaching reflection strategy is selected: the first step is to create a problem situation that leads to students' cognitive imbalance, that is, to cause students to think through the problems of buses and trucks; the second step is to let students think, analyze and summarize the new knowledge equation; the third step is to enable students to immerse themselves in

mathematical culture by combining the cultural background of unitary first-order equation, so as to lay a foundation for learning mathematical concepts; the fourth step is to help students overcome the difficulties of this class by the combination of teaching and practice. After completing the course, we should consider whether there are problems in the teaching process of this class, so as to accumulate teaching experience and avoid repetitive mistakes.

Mathematics normal school students' understanding of teaching reflection has been preliminarily understood after reading 164 effective teaching designs.

Table 6 Understanding of Teaching Reflection

Content	Questions	Items	Frequency
Analysis on the understanding of homework assignment after class	Is there a record of teaching reflection after the end of teaching activities?	Yes	19
		No	145
	Can the designed teaching activities detect students' achievement of teaching goals? (19 people who reflected on teaching)	Yes	8
		No	11
	Is the instructional design modified after reflection? (19 people who reflected on teaching)	Yes	9
		No	10

Among the 164 teaching designs collected, only 12% of the normal school students recorded teaching reflection after the teaching activities, which shows that mathematics normal school students do not realize the importance of teaching reflection, and they still need to make continuous efforts in teaching reflection. In these 19 teaching reflections, there are still some mathematics normal students who do not reflect seriously, but perfunctorily complete the task. Here, eight mathematics normal students think that the designed teaching activities can test whether the students have achieved the teaching goals, and nine have modified the teaching process after reflection, and recorded the shortcomings and advantages of the original teaching design. It is considered that we should record the problems in the teaching process after class, because only in this way can we really achieve the effectiveness of teaching reflection, rather than just one or two words as teaching reflection.

4.7 Summary

According to the analysis of the collected teaching design, most of the mathematics normal students will complete the teaching design seriously, but some of them will refer to the excellent teaching design on the Internet, so their teaching design is repetitive. There is no denying that the teaching design ability of mathematics normal students is still good, after all, they have not participated in the internship at present, and their ability will be further after the internship. According to the above six aspects of the survey, the results are as follows:

The mathematics normal students have a full understanding of the teaching design as a whole, and the design links are complete. Most of them have an accurate understanding of the whole teaching design, which can not only accurately complete the writing of teaching objectives, but also grasp the important and difficult points of teaching. However, they are often unable to accurately break through the important and difficult points in teaching, and do not pay attention to the assignment of homework after class and teaching reflection.

Most of them can set three-dimensional goals in the design, and can write the goals of "knowledge and skills" in accordance with the requirements of the curriculum standards. However, they will inevitably use some misexpressions in the goal compilation of "process and method", such as "make students.....", indicating that some of them fail to regard students as the main body of classroom learning. When compiling the goal of "emotion, attitude and values", they are more formal and model, and basically stay in the aspect of "developing students' interest in mathematics learning".

Most of them can grasp the important and difficult points in teaching, but this is reflected in their teaching arrangements to emphasize the key points of teaching and resolve the difficulties in teaching. Obviously, they can realize the importance of important and difficult points in teaching, but they still lack the ability to implement them effectively.

Almost all normal school students can reasonably arrange various teaching links, design appropriate teacher-student activities, and ask enlightening questions, but some of them fail to accurately connect and transmit knowledge points, and can not provide corresponding results for their questions and reasoning.

According to the analysis of teaching design, most mathematics normal school students are required to complete after-class exercises without thinking, and even some normal school students do not mention after-class homework; only a small number of normal school students carefully assign after-class homework to select

topics, design questions and ask students to think about the problems related to the teaching content. This suggests that most normal school students do not pay attention to the assignment of after-class homework and do not understand the importance of after-class homework.

Among the 164 teaching designs collected, 19 normal school students recorded teaching reflection after teaching activities, while mathematics normal school students did not attach importance to after-class teaching reflection. In fact, teaching reflection is an essential way for their professional development. The reflection and serious improvement of the whole teaching design empower a real progress.

5. Suggestions on The Development of Teaching Design Ability of Mathematics Normal Students

The instructional design ability of mathematics normal students without internship was investigated. This, combined with the problems found in it, makes it possible to put forward the following three suggestions for the development of the instructional design ability of mathematics normal students.

5.1 Based on Mathematics textbook, grasp the essence of Mathematics

Mathematics textbook is a whole involving basic concepts, basic laws, basic facts and basic methods of mathematics, so we should comprehensively consider the logical law of mathematics itself, as well as the knowledge law and psychological development of students. This whole is not an enumeration of knowledge and principles, nor a simple summary of all kinds of mathematical knowledge, but a continuous, intersecting and closely related knowledge network. Teaching materials are not only the basis of reference materials for teachers and students in teaching, but also the material basis of all mathematics teaching activities. In the aspect of teaching design ability, mathematics normal students should analyze the teaching materials from different angles such as designers, students and teachers, and analyze the knowledge structure and mathematical characteristics of the teaching materials according to different contents[11]. This requires mathematics normal students to make good use of mathematics textbooks in teaching design, show the important and difficult points in classroom teaching, pay attention to the connection of teaching contents in each link, and gradually strengthen the overall ability of mathematics teaching design.

The curriculum standard holds that the essence of mathematics teaching is "the teaching of mathematics activities, the process of communication, interaction and common development between teachers and students." As an important basis of mathematical activities for teachers and students, teaching materials play a very important role. The current curriculum reform requires focusing on the extraction of teaching resources, the expansion of mathematical knowledge and the full use of teaching materials. The premise of grasping the essence of mathematics teaching is to correctly understand and use teaching materials.

In a word, mathematics normal students can only grasp the focus of teaching and grasp the essence of mathematics teaching if they understand the intention of the designer to design teaching materials. Only in this way can we continuously improve the teaching design ability of mathematics normal students.

5.2 Study mathematical design and practice regularly

The existing research confirms that mathematics normal students do not have the ability to fully understand and make full use of teaching materials in the process of design teaching. They accurately grasp the key points and difficulties, and basically meet the requirements of curriculum standards, but they can not put forward effective means to overcome them in the follow-up teaching process. To make matters worse, some mathematics normal students seldom pay enough attention to after-class homework and reflection. These problems arise because they lack sufficient teaching experience and ability.

An excellent teaching design is inseparable from careful polishing. Excellent teaching design in the classroom may not necessarily achieve the desired teaching results, because such a teaching design may not be suitable for you or your students. This requires us to strive to improve the ability of instructional design, so that our instructional design can correspond to a variety of teaching situations, so that each class can achieve the desired results. According to the text analysis, some mathematics normal students' teaching design is exactly the same as some online teaching design, which shows that this part of the students do not seriously design their own teaching process, just to cope with the teacher. The teaching design referenced by some normal school students is not suitable, and the quality of the selected teaching design is not high. In the investigation, mathematics normal school students were asked to design the teaching process of mathematical Unary First Order Equation, but some normal school students' teaching design was designed according to the textbooks published by Su Education Edition, and they obviously did not take the assigned tasks seriously. In instructional design, we are allowed to refer to other people's designs, but blind plagiarism is absolutely prohibited. On the contrary, we should independently design the teaching design that suits us.

Therefore, when referring to other people's teaching design, we should carefully select and determine the high-quality teaching design from it; then explore the advantages and disadvantages from the excellent teaching design, and finally apply the excellent teaching design found from it to our own teaching design. In this process,

long-term practice can always develop the ability of instructional design. The purpose of learning other people's teaching design is to develop yourself, rather than blindly stealing other people's ideas. Although instructional design can be completed, regular instructional design exercises are the main way to improve the ability of instructional design.

5.3 Set up the consciousness of reflection and develop Mathematical thinking

The existing results proved that an amount of normal school students refuse to reflect after class and do not actively put forward the improvement plan for teaching design. Teachers can only rely on themselves to prompt their teaching design ability, and mathematics normal students, as future people's teachers, must be equipped with sufficient teaching design ability. Only by making continuous efforts can we improve our ability of instructional design. Mathematics normal students should also constantly update teaching ideas and methods, keep learning, and accumulate rich teaching experience. At the same time, the consciousness of self-reflection is indispensable, because only reflection on the basis of self-learning can be improved. In addition, mathematics normal students should have the courage to break the rules, make progress in continuous reflection, and constantly develop their mathematical thinking ability in the process of reflection.

Confucius once said: I reflect on myself three times a day. Reflection is indispensable in the path of teachers' growth. After a class, every teacher must have his own experience, such as what are the innovations in the classroom, what are the deficiencies in organizing teaching, whether the inspiration of the questions is appropriate, whether the training in class is up to standard, etc. Teachers should sum up these gains and losses in time, sort out and choose, and think about how to carry out similar teaching. Reflection after class must be timely and persistent, which helps to accumulate positive results.

Teachers are required to rethink the mathematical content and their own mathematical thinking process in order to help students construct mathematical thinking[12]. This means that teachers should reflect in teaching, because only in reflection can they develop, so as to provide new learning methods for their growth. If teachers try to make progress in this area, they should actively reflect, improve their mathematical thinking, and then constantly improve their class ability, and finally promote the progress of students.

6.Conclusion

To sum up, this study discusses the teaching design ability of mathematics normal students who did not participate in educational practice through the method of text analysis, determines the overall performance characteristics and existing problems of this whole in the link of teaching design, and provides some suggestions for the development of normal school students' teaching design ability combining with specific analysis.

Since the limitation of time and my ability, this study focuses on analyzing the teaching design texts of some students in a school, and the conclusion is mainly limited to subjective analysis and judgment. As a result, it is difficult to depict the teaching design ability of all normal school students in detail.

Other influencing factors should be taken into account in future research, such as whether normal school students can accurately judge which areas are prone to be confused and may make mistakes in students' mathematics learning, whether normal school students can better present their own designs in practice after teaching design, etc.

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