

The Research on Cultivation of the Education Master Candidates Based on the Improvement of the Mathematical Operations Training Ability

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Abstract

Mathematical operations are the important part of core qualities and are indispensable for students in the process of learning mathematics. The primary and secondary school teachers should own corresponding mathematical qualities and the ability of mathematical operation qualities training. The education Master candidates is the backbone of mathematics teaching in primary and secondary schools in the future. Therefore, the colleges and universities should focus on cultivating their mathematical operation ability, teaching practice ability and the ability to research problems in the process of training Education Master candidates. Meanwhile, they should also improve their cultural qualities, etc., in order to guide them to adapt to the training of mathematical qualities in the future.

Keywords

Mathematical Operations, Core Qualities, Education Master Candidates, Mathematics Teaching

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1. Introduction

The Ordinary Senior High School Mathematics Curriculum Standards (2017 Edition) put forward the six core qualities of mathematics, and required middle school teachers to cultivate in mathematics teaching. They are: mathematics abstraction, logical reasoning, mathematical modeling, mathematical operations, and intuitive imagination, data analysis [1]. Among them, The mathematical operations are undoubtedly the most basic and critical and used most frequently. They are the centralized presentation of other core qualities. For example, mathematical modeling is often used when analyzing operands; logical reasoning is also used when selecting an operation rule; the operation itself is a data analysis process; when guessing the direction of operation and determining the result of an operation, Intuitive imagination

also plays an important role. Therefore, it is vital to cultivate students' mathematical ability [2]. So what is the ability to cultivate mathematics qualities? In order to cultivate students' mathematical operation qualities, what kind of conditions and qualities should they have as a middle school math teacher? As an imminent math teacher, how should the master of education be trained in college? This article started from the meaning of mathematics operations, mathematical operation qualities and the ability of mathematical operation qualities training and mainly discussed the requirements and the training that the universities were supposed to give the education master candidates for improving their ability of mathematical operation qualities training.

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2. The Mathematical Operations Qualities and the Ability of Its Training

2.1. The Meaning of Mathematical Operations Qualities

Mathematical operations is the process of solving mathematical problems based on the algorithm, on the basis of clarifying the operation object. It Mainly includes: understanding the operation object, mastering the algorithm, inquiring into the operation idea, selecting the operation method, designing the operation program, and obtaining the operation result [3].

Mathematical operations are the basic means of solving math problems and are deductive reasoning and the basis for computer problems [4].

2.2. The Meaning of the Ability of Mathematical Operation Qualities Training

The ability is the comprehensive quality that is achieved by accomplishing a goal or task. People have different capabilities in completing activities, it refers to the objective conditions necessary for the successful completion of an activity. Ability is a personal psychological characteristic that directly affects the efficiency of activities and enables the activities to be completed successfully [5][6].

The ability of mathematical operation qualities training refers to the comprehensive quality that is reflected in the teacher's learning ability or the examination situation and the teacher's numeracy training strategy to help students improve their mathematics computing ability according to student's learning situation or exam [7].

3. The Requirements to the Middle School Mathematical Teachers

3.1. Middle School Mathematics Teachers Should Own Solid Basic Knowledge and Multiple Teaching Methods

In order to cultivate students' mathematical operation qualities, teachers need to understand many basic knowledge about mathematical operations, accurately understand the object of operation, master the algorithm, thoroughly understand the theory of mathematics, and understand more computational methods, and teachers have these knowledge of operations in order to lay a solid foundation for the development of students' operational qualities.

In classroom teaching practice, the cultivation of mathematical operation qualities is everywhere. The key lies in how teachers can guide and inspire students. This requires teachers to master a number of methods and techniques to develop students' understanding and mastery of calculation methods, and to use them skillfully and flexibly in classroom teaching.

3.2. Middle School Mathematics Teachers Should Own Ability to Solve Multiple Questions

Reasonable selection of a simple calculation method can not only perform operations quickly, but also ensure the accuracy of calculations. The more steps there are and the possibility of errors will increase. Therefore, according to the conditions and requirements of the problem, a reasonable choice of a simple and quick method is the key to improving the computing ability. This requires that teachers have the ability to solve multiple problems, develop students' broad thinking, choose the simplest and quickest one among a variety of problem-solving methods, and then quickly and accurately perform calculations to improve the students' mathematical ability [8].

3.3. Middle School Mathematical Teachers Should Own the Ability to Summarize

Most of the students nowadays do not use inferences when doing questions. They will do this question, and when they do the same kind of distortion, they will make mistakes or have no idea at all, so this requires teachers to have the ability to summarize. Many of the topics in the exam are stylized, but there are "routines" to solve the problems of the textbooks. Therefore, teachers in teaching should help students to establish a problem-solving module, sum up the schema of similar topics, so that students can change the problem when they do questions and improve the accuracy of the problem [9].

3.4. Middle School Mathematics Teachers should Own Excellent Teaching and Design Capabilities

The key to cultivating mathematics qualities is "learning by doing" and "enlightenment by doing". Only by continuously practicing can students improve their mathematical ability. Therefore, teachers should have excellent teaching design ability, choose suitable examples as the carrier of teaching, and design teaching according to the students' interests and needs. The selected examples should have certain scientific and cultural value of understanding mathematics, which can arouse the interest of students and improve students' ability to ask, analyze and solve problems [10].

The teaching design ability also includes the teacher's ability to adapt randomly, that is to say, students can pre-set the

problems that arise in the course of operation and learning. Problems that arise during lectures can be effectively dealt with, and propose corresponding solutions for different issues.

In addition, different students may have different degrees of acceptance of different computing content. This requires teachers to design mathematics based on different contents and students, and to develop students' mathematical operation qualities according to their abilities.

3.5. Middle School Mathematics Teachers Should Own Strong Measurement Capabilities

After the teacher has done the above work, in order to test whether the work has achieved the desired effect and whether the student has really improved the computing ability, the teacher should also have a strong measurement ability, and have a comparatively scientific investigation method for the students' operative qualities and get real and effective feedback information from this. Therefore, teacher can accurately grasp the students' mastery of the current teaching methods to make reasonable and effective adjustments and improvements, so as to better train students' mathematical operation qualities.

3.6. Middle School Mathematics Teachers Should Have Good Computing Habits

When students make mistakes, it is often that they do not calculate or do not understand reason, but because of bad calculation habits. Therefore, cultivating students' mathematical operation qualities requires students to develop good computing habits. This also requires teachers to have good calculation habits when teaching regularly, and pay attention to reasonable board design and standard writing, this is for words and deeds and affecting students subtly. Good computing habits include: the habit of careful examination of questions, the estimated habits, the habit of drafting, and the habit of writing a careful examination [11].

3.7. Middle School Mathematics Teachers Should Have Strong Computing Skills

In order to cultivate students' mathematical operation qualities, teachers should not only have a good calculation habit, but also have a strong computing ability, so that in the design of teaching can fully understand the content learned and think ahead of time that students should be adequately prepared for questions they may encounter during the course of their study.

3.8. Middle School Mathematics Teachers Should Have Good Mathematical Thinking Quality

Training students' mathematical operation qualities requires

students to develop good mathematical thinking skills. The corresponding teachers must also have good mathematical thinking qualities to help students understand the algorithms and master the algorithms. The mathematics discipline has the characteristics of rigorousness. When it comes to mathematics operations, it is necessary to consider the problem more strictly and have a full range of choices in calculation methods, this requires the rigor of the teacher's mathematical thinking; reading mathematics topics should teach students to look at the nature and connections through phenomena, grasp the key and laws of the problem, understand the topics thoroughly and thoroughly, and grasp the algorithms in depth, this requires the profoundness of mathematical thinking; in mathematics learning, teachers should pay attention to cultivating students' multi-faceted and multi-angle thinking methods. One topic can come up with different solutions, broaden the problem-solving ideas, and explore the direction of operations from multiple angles, this requires the broadness of teachers' mathematical thinking [10].

4. The Cultivation of Education Masters Candidates in Colleges and Universities

Education Master candidates major is a specialty for the field of education, its ultimate goal is to cultivate high-level teachers who understand theory, practice and engage in educational practice [12]. Therefore, Education Master candidates is both a student and a pre-service teacher. Although Education Master candidates can now learn the theoretical knowledge of systematically specialized mathematics in colleges and universities, they can also learn basic teaching theories and methods of education management, and can quickly adapt to and solve problems encountered in education and management after participating in work [13]. However, after the new curriculum reform is proposed, it can be seen that the mathematics curriculum standard attaches great importance to cultivating students' core qualities of mathematics. This requires the Education Master candidates to receive guidance on the core qualities of mathematics, but the training plan for Education Master candidates has not been adjusted accordingly. Education Master candidates still has no experience in cultivating students' core qualities of mathematics. Among them, for the most basic mathematical operation qualities, if students do not get education related to mathematical operations, they do not have the ability of mathematical operations, and they do not master the methods and skills of cultivating students' operational qualities during the master's degree, it will be difficult to implement mathematical operation qualities in the teaching process after graduation.

4.1. Higher Education for Education Master Candidates should Strengthen the Teaching of Knowledge in Mathematics Operations

If teachers want to cultivate students' mathematical operation qualities, they must first have the relevant knowledge of mathematical operations. Therefore, during the training of the Education Master candidates, the school should set up the "mathematical core accomplishment" or "comprehensive mathematical curriculum standards" course, in which to teach the knowledge and theory of mathematical operations, including the concept of numbers and operations. Because the correct understanding of the concept of related numbers and operations is a prerequisite for mathematical operation qualities; Algorithms and algorithms, because the algorithms and algorithms are two key points of mathematical operation qualities; and other knowledge related to mathematical operations.

4.2. Higher Education for Education Master Candidates Should Combine with a Variety of Teaching Methods

Due to the educational specialty of the master's degree in education, in order to cultivate Education Master candidates to adapt to the future training of students' mathematical operation qualities, we should continue to attach importance to the method of teaching and must actively adopt effective combination of multiple teaching methods [14]. At present, in the universities, public courses such as "Psychological Development and Education" and "Modern Education Technology" are large-scale teaching. There are about two to three hundred students in one class. This kind of teaching makes the absenteeism rate high but the efficiency of learning is very low. The students can hardly learn anything in the classroom, and the exam at the end of the semester is also something to cope with. Schools can teach them in small classes, and each specialty has targeted teaching. For example, teachers guide students to discuss the types of errors that each elementary and middle school student is prone to misuse, and use the learned psychology and pedagogic knowledge to analyze the causes of errors, and discuss how to teach students in this area, how to guide students to sort out the wrong questions, and how to help students summarize the problem-solving module of a certain type of problem. For another example, during the learning of each lesson, you can first determine the aspects of the discussion, such as algebraic operations, factorization, equations, inequalities, etc. Everyone should study in-depth and think independently in advance, speak freely, put forward their own teaching ideas for improving students' mathematical ability, brainstorm ideas, cultivate the broadness of students' thinking, and improve students' ability to solve problems with multiple solutions.

4.3. Higher Education for Education Master Candidates Should Improve the Teaching Practice of Education Master Candidates

The improvement of teaching and learning ability is very important for the Education Master candidates that will soon become a teacher. This directly affects the future performance in education and how to improve students' mathematical ability. Therefore, colleges and universities should pay attention to the teaching practice of the Education Master candidates, so that Education Master candidates can master the methods and skills of cultivating students' mathematical operation qualities in the teaching practice.

4.3.1. Increasing the Time of Students' Simulation Teaching

During the current master's degree in education, most of the students are still mainly engaged in learning theory, and the internships are mainly concentrated in the second year. Training students' mathematics qualities still needs to be slowly infiltrated throughout the entire teaching process. In the first year of study, students do not have many opportunities to stand on the podium and will not find any problems that may arise during the teaching process. Therefore, during the cultivation of the Education Master candidates, more micro classrooms will be constructed to increase the time for students to teach Simulation classes. Two or three exercises may be performed each week to truly implement the above-designed teaching, the tutor then looks at the instructions, points out the problems, and finds out better content materials and teaching strategies for cultivating students' mathematical operation qualities.

4.3.2. Increasing Opportunities for Educational Internships

How to train students' mathematical operation qualities, apart from theoretical exploration and virtual teaching, the most important thing is to explore the cultivation method in the real teaching process. In the process of cultivating Education Master candidates, the school can organize students to attend or practice internships in primary and secondary schools, face real classrooms, and experience the cultivation of students' mathematical abilities in the classroom. At the same time, it can also cultivate the awareness and ability of masters to find problems, and consider how they will deal with or explain when they encounter the same problems, accumulate some direct experiences, and realize the combination of theory and practice. Schools can also organize students to actively participate in some high-level teaching observation classes or teaching seminars. Every year, all kinds of schools around the country will hold a variety of teaching observation classes, which include teaching about the development of mathematics

and students can attend the study and accumulate indirect experiences [15].

4.4. Higher Education for Education Master Candidates Should Improve the Research Ability of Education Masters' Problems

In the teaching process, many front-line teachers will reflect: the students' computing ability is not strong, and they often "understand it when they do it, and they do it wrong when they do it" [16]. Why does this happen? This requires colleges and universities to develop master's ability to study problems, focus on classroom observation, conduct in-depth research on errors in class or during practice, find out objective and subjective reasons for students' mistakes, and propose corresponding countermeasures against existing problems, then explore and discover more appropriate teaching methods. In the process of cultivating Education Master candidates, the tutor can specify the topics, determine the direction, and allow the students to consult the materials themselves, analyze the status quo existing, problems and solutions of the research in some areas, in order to change the way of thinking of masters and develop master's research skills on problem-solving.

4.5. Higher Education for Education Master Candidates Should Cultivate the Cultural Quality of Education Master Candidates

As mentioned above, the training of students' mathematical operation qualities is based on the selection of suitable examples as a vehicle, which can not only teach students' knowledge, but also stimulate students' enthusiasm for learning. For example, when we talk about "sum formula of sum of equal difference", using Gaussian to introduce the solution of "1+2+3+...+100" can arouse the attention of students; When we say "Solve Univariate Equation", solving the age of Diophantine, this problem will not be so boring, and students can be interested in it and willing to solve the problem. All of these require teachers to have rich cultural qualities. Therefore, during the master's degree in education, the teaching of ancient books such as the "Nine Chapters of Arithmetic" or "Zhou Bi Suan Jing" was taught to understand the topic of intelligent mathematics both in ancient and modern times.

In addition, mathematical operation qualities is the foundation of other mathematical operation qualities, so schools should also pay attention to the cultivation of other core qualities.. In the entire process of cultivating master's mathematical operation qualities, it is also necessary to focus on training the master's computing ability, develop their good calculation habits, and cultivate master's patience and

meticulousness.

5. Conclusion

In general, based on the cultivation of mathematics qualities, we must not only know how to train as a teacher, but also clarify what kind of ability or quality teachers should have and how colleges and universities should guide Education Master candidates to adapt to the future training of mathematical operation qualities in order to cultivate students. Therefore, starting from the meaning of mathematics qualities and the ability of mathematical operation qualities training, this article discusses in detail the skills and qualities mathematical teachers should have and how universities should guide Education Master candidates in order to cultivate outstanding teachers with the ability of mathematical operation qualities training.

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