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Training Strategy of Students' Operational Ability Based on the Core Quality of Mathematical Operations in High School

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Abstract **– With the deepening of education and social communication, the cultivation of students' thinking ability is particularly important in the process of high school mathematics teaching. However, due to the past exam-oriented education teaching concepts deeply rooted in the hearts of the people, high school mathematics teachers in the teaching process focus on students' thinking ability. At the same time, due to teaching progress and other objective factors, the cultivation of students' mathematical computing ability is ignored. With the continuous development of the new curriculum reform of senior high school mathematics, the cultivation of mathematics operation, the core quality, has aroused extensive concern of senior high school mathematics teachers. In this paper, starting from the analysis of the core literacy of mathematical operation, we deeply excavates the defects of mathematical operation in the current high school mathematics teaching process, and puts forward the corresponding promotion strategies, so as to effectively cultivate the high school students' mathematical operation ability.**

Keywords **– High School Mathematics Teaching, Mathematical Operation, Computational Ability.**

I. INTRODUCTION

Mathematics has always been with us in the history of human civilization. In modern basic education, mathematics has always played a decisive role. Learning mathematics well will also play a very important role in our daily life. Mathematics is life, life is full of mathematics. Qiu Zonghu, a famous math Olympics expert, pointed out: "If you want to learn math well, you must first know how to calculate and how to do it well." People call early mathematical operations arithmetic. Operating is not only an important part of traditional middle school teaching, but also a new and higher requirement for arithmetic in the future with the development of mathematics [1]. In the 'Mathematics Curriculum Standards for Senior High Schools 2017 Edition' in China, it is clearly pointed out that mathematics is a subject based on abstract structure, which comprehends and expresses the essence, relationship and law of things in the real world through symbolic operation, formal reasoning and model building [2]. Mathematics literacy is the basic literacy that every person in modern society should possess. The core accomplishment of mathematics operation is not only a reflection of the common problems existing in solving problems of senior high school students at this stage, but also an indispensable link in the process of cultivating students' mathematical accomplishment [3]. The first requirement of developing intelligence and ability is to train students' operation ability, which is mainly because the operation ability is not only a powerful tool for social production, life and further learning, but also plays a vital role in training real mathematics talents. Senior high school students should not only grasp the basic knowledge of textbooks and cultivate good thinking ability, but also be able to flexibly use excellent mathematical operation ability to solve problems [4]. Of course, how can students develop good learning habits at the same time, explore a variety of methods of operation, experience the colorful process of mathematical operation is also one of the main problems contemporary teachers should think about. The cultivation of "operation ability" is the organic unity of goal and process, and the improvement of

students' operation ability is also an active self-construction process within the individual. Therefore, it is necessary for every high school teacher to face up to the high school students' mathematical operation ability and put forward effective training strategies for improving mathematics teaching and developing students' core mathematical literacy.

II. Analysis of the Development of Mathematical Operations in High School Mathematics Teaching at the Present Stage

A. *Analysis of the Current Situation in China*

In the existing mathematics teaching process, the most common problem among students is that students lack the corresponding learning process of operation exercises. In the process of teaching, teachers often neglect the requirement of mathematical operation because they attach importance to the cultivation of students' thinking ability. In the long run, students' computing ability will be greatly reduced, thus hindering students' all-round development [4]. In the aspect of symbolic operation, students often fail to solve complex symbolic operation problems because of their poor consciousness of symbols, which leads to negative emotions that are very obscure and difficult to understand in mathematics. But teachers can not accurately grasp the learning situation, which will make the teaching effect unsatisfactory. In order to better and more truly understand the current situation of high school students' arithmetic ability in China, this paper collects data through test and questionnaire. The test questions and questionnaires are all about mathematical operation ability. The questionnaires involve five aspects: high school students' enthusiasm and enthusiasm for mathematics learning, high school students' mastery of basic mathematics knowledge, the influence of psychological factors, the use of mathematical thinking mode and teachers' teaching methods. Finally, the data are analyzed and summarized, and the final conclusions are as follows: (1) More than 50% of senior high school students are not motivated to learn mathematics, and generally feel that their computing ability is poor. In the examination, the scores lost due to the lack of calculation are more than 20 points. (2) A large number of senior high school students cannot grasp and memorize basic mathematical knowledge very well. Basic knowledge is an important part of computing ability. When they can't do more steps, more than 40% of the students choose to give up and less than 60% of them can finish it. This shows that a large number of people can do it for themselves. They lack of confidence in computing ability. (3) Mathematics thinking mode also has a great impact on the high school students' computing ability. Many high school students agree that their poor computing ability is due to their improper use of mathematical thinking mode. They do not think clearly when they do operations, and they cannot build a clear theoretical framework if they effectively grasp the basic knowledge. It is conducive to the improvement of high school students' computing ability. (4) In fact, besides objective factors, psychological factors also affect the computational ability of high school students to a large extent. The survey results show that the next step cannot be carried out when encountering problems. (5) In the process of teaching, teachers adopt oral teaching, no blackboard writing, no training of arithmetic ability, which has a certain impact on students' arithmetic ability, can not improve.

B. *Current Research Situation Abroad*

Foreign countries pay more attention to the cultivation of thinking ability than China, which also leads to the weakness of computing ability. In recent years, more and more attention has been paid to the cultivation of students' mathematical operation ability abroad [6]. At the same time, teachers also propose to train students' good

mathematical operation ability in the process of teaching, and create basic conditions for students' development [7]. For the teaching process of mathematical operation, mathematicians say that on the basis of necessary mathematical operation exercises, students should gradually improve their mastery of the basic methods and Strategies of operation, and try their best to experiment and popularize them in the teaching process of high schools and colleges [8].

III. Training Strategies of Mathematical Operational Ability

The central task of cultivating mathematical operation ability is to guide students to understand, master and explore the purpose of operation, to understand clearly the purpose of operation, to dig deeply into the essence of problems, and to find ways and means of solving problems. To solve problems, we should learn to observe and choose the right way of thinking, which can not only reduce the operation cost, but also broaden our thinking and improve problem solving ability. The cultivation of mathematical operation ability lies in how to develop and cultivate teachers. It also requires teachers to sum up experience in teaching practice, innovate teaching methods and expand students' thinking quality. Teachers should carry forward the experience of traditional operation teaching, constantly improve teaching methods in effective classroom teaching, and make operation teaching coordinate development in arithmetic, arithmetic and skills. We should improve teaching quality, truly advocate solid and effective teaching, and implement rational operation teaching that respects students' individual differences.

[*Understanding Operational Objects*] Concepts reflect the essential attributes of objective things and the relations between them. Attaching importance to the teaching of basic concepts in computational teaching can help students clearly understand mathematical theorems, the rules of mathematical operations, and not confuse the meaning of mathematical symbols, thus providing strong support for the improvement of students' computational ability. In teaching, we should pay attention to letting students understand mathematical concepts rather than practicing them blindly. At the level of understanding the operation object, we should pay attention to patient explanation, not too hasty to let students directly memorize the operation object, so that they will be confined to a single operation object, and could not cite the same thing.

[*Grasp the Rules of Operations*] "Computing teaching needs to let students not only understand arithmetic intuitively, but also master Abstract rules. It also needs to let students fully experience the transition and evolution process from intuitive arithmetic to abstract arithmetic." In practice, the teaching of arithmetic should experience "intuitive operation - representation".

[*Exploring Operational Thoughts*] In teaching, the more effective method is contrast practice and variant practice. Contrast exercises: We can provide enough space for students to observe, compare and distinguish; Variant exercises, that is, a multi-form exercise, help students improve the flexibility of thinking. It reminds students that in the process of operation, they can consider from many aspects and angles, compare which operation method is simple and accurate, and then use which method to operate. Train students to apply the concept of flexibility, to choose appropriate formulas, and to use mathematical ideas and methods reasonably. Therefore, we should infiltrate mathematical thinking and methods in class, promote students' enthusiasm for learning, improve students' understanding of operation, and improve their mathematical literacy in invisible.

[*Find the result of operation*] it is also wrong to get the result of operation on the basis of understanding the operation object, mastering the operation rules and thinking. Then we should start from the following aspects: (1)

pay attention to teachers' demonstration teaching. In many cases, students are imitating teachers, because imitation is not only a basic way for a person to learn all kinds of things, but also one of the important ways for high school students to form learning habits. (2) Pay attention to cultivating students' habit of solving problems. The essence of education is to cultivate their habits and enhance their abilities. We are educated in school for the purpose of cultivating habits and enhancing abilities. When we leave school, we still need to be educated in many ways and educate ourselves. The purpose is to form habits and enhance abilities. The better habits are, the better abilities are. In the process of teaching, teachers should be good at instructing students to form the habit of analyzing and examining questions carefully. They should not do it blindly. They should examine problems carefully and analyze them carefully so as to find the simplest way to solve problems quickly.

IV. Conclusion and Discussion

In a word, mathematical operation is the basis of effective learning of mathematics in senior high schools and the key to achieving high marks in exams. The ability of mathematical operation cannot be cultivated in a short time. It needs teachers' demonstration and guidance, but also students' long-term persistence. There are no shortcuts to find. In the process of teaching, teachers should pay attention to students' mathematical operation, stimulate students' thinking enthusiasm, train students' mathematical operation ability in a planned and purposeful way, and make "mathematical operation" a solid foundation for success.

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