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Research on the Training of Junior Middle School Students' Mathematical Ability

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Abstract **– Mathematics core accomplishment is a topic in the field of education research. It is of practical significance and practical value to deepen the reform of basic education mathematics curriculum. At present, the six core qualities are: mathematical abstraction, mathematical reasoning, mathematical operation, mathematical modeling, visual imagination and data analysis. Among them, mathematical operation ability is one of the core qualities of mathematics, which also plays a decisive role in students' academic performance and affects the study of other subjects. Since the resumption of the college entrance examination, the ministry of education has made several large-scale adjustments to the teaching syllabus. The requirements of the syllabus for students have been changed from the need to "cultivate" students' operational ability to the need for students to "have" operational ability. It can also be seen that computational ability plays a very important role in the process of students learning mathematics. For junior high school students, mathematical calculation ability is the most basic ability that students should have, and it will affect the effect of students' learning of mathematics. The computing ability of junior high school students has a great impact on students' thinking ability, learning quality of mathematics and learning habits of mathematics, and has a decisive impact on the improvement of students' comprehensive ability of mathematics learning. We need to effectively understand the factors affecting the mathematical calculation ability, and put forward the corresponding countermeasures to improve the calculation ability, comprehensive and efficient to improve the mathematical calculation ability of junior high school students. In the end, this study further cultivated junior high school students' arithmetic ability through four aspects: first, it emphasized the foundation to help students grasp the mathematical arithmetic law; Second, pay attention to training, improve the comprehensive ability of students; Third, pay attention to standardize and develop good computing habits; The fourth is to cultivate interest in computing and stimulate learning desire.**

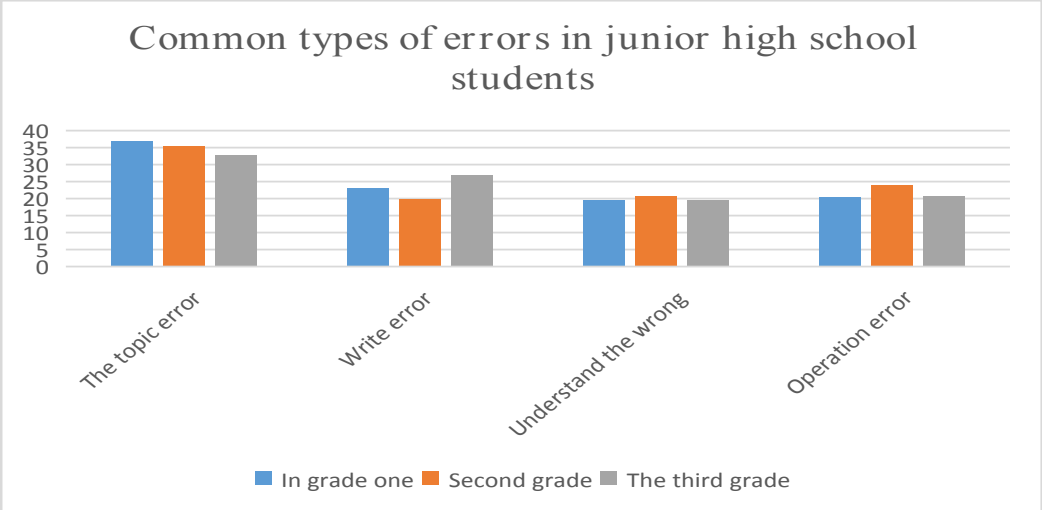
Keywords **– Mathematics Teaching, Operation Ability, Effective Strategy Solution.**

I. INTRODUCTION

Through the research on the actual teaching process, it is found that both teachers and students have many problems in mathematical operation ability, and many teachers and students neglect the classroom training of mathematical operation due to the influence of many factors such as teaching progress, pressure of entering a higher school and pressure of exam-oriented education. Mathematics operation ability almost covers the whole high school mathematics teaching content. Even though many students have good logical thinking ability and spatial imagination ability, they can't get rid of errors in operation. When students make mistakes in calculation, teachers are accustomed to tell students to recalculate, but students may not understand their mistakes in place, do not know how to start, over time, the calculation ability will become worse and worse. After consulting relevant literature and materials on mathematical operation ability, it can be seen that in recent years, educators have paid some attention to the problems of high school students' mathematical operation ability, and have put forward some improvement countermeasures accordingly. However, the research level has always been limited to students themselves, without considering the influence of other factors on students' mathematical operation ability. Based on this, this paper clearly puts forward: 1. What causes students' poor mathematical operation ability: 2. Problems

of junior high school students in mathematical operation: 3. How can teachers effectively change the current situation of poor mathematical operation of junior middle school students? 4. How to effectively use the teaching environment to improve the mathematical ability of junior middle school students; This series of problems make the author want to conduct an in-depth investigation on the current situation of junior high school students' mathematical ability, and strive to give relevant countermeasures to improve the mathematical ability of senior high school students through the research results. On the basis of previous studies, this paper will further study the influence of the relationship between students, teachers and teaching environment on the mathematical operation ability of junior high school students. With the continuous development of teaching, mathematics teaching process not only needs students to master relevant knowledge, but also needs to cultivate students' mathematical ability, develop students' intelligence, help students form good mathematical quality, and enable students to adapt to the rapid development of society. With the rapid development of science and technology, mathematics is gradually integrated into daily life and plays an important role in the process of solving practical problems. Therefore, the cultivation of mathematical operation ability needs to be focused on. After understanding the current situation of students' mathematical operation ability, this paper analyzes the main factors affecting the mathematical operation ability, and puts forward effective countermeasures, providing some help for improving students' mathematical operation ability.

Through the classification of different grade students math wrong topic roughly divided into the following four categories, different grade of each type of proportion, roughly the difference is not big, therefore students operation ability in mathematics is very important, it is necessary to improve the students' operation ability, many students will reflect, to solve the problem. Can understand knowledge, once the calculation is a bit complicated finally certainly can appear error. We can observe the histogram to analyze the reasons and give corresponding strategies.



We want to study the comprehensive improve the ability of students to learn mathematics calculation, so we should learn what are the factors influencing the students' ability to calculate, the teacher in the classroom will need more observation, more thinking, more of wrong topic to collect the information, and find the corresponding strategy according to these factors, develop the students' ability of calculation, learn to according to their aptitude, respect each student's different. According to the experience of these years of internship and extracurricular tutoring students, the factors that affect junior high school students' computing ability are summarized as follows.

A. *The Factors Affecting the Mathematical Ability of Junior Middle School Students*

1. *Not Paying Attention to Mathematical Operations*

Mastering concept is the foundation of learning mathematics, and forming concept is the necessary condition of mastering double basis of mathematics. Students can only explore the nature of concepts in depth on the premise of clear concepts. Ambiguity of concepts is another important factor that causes operational errors. In the process of calculation, many times students only pay attention to multiplication, division and power, ignoring the operation range, resulting in errors.

2. *Lack of Mathematical Thinking Mode*

There are many solutions to a math problem. Multiple solutions are common. Students should learn to choose the best. Lack of sense of analogy when I meet difficulties in solving problems, I do not know how to find the method of analogy through my familiar problems, so as to find the way to solve problems.

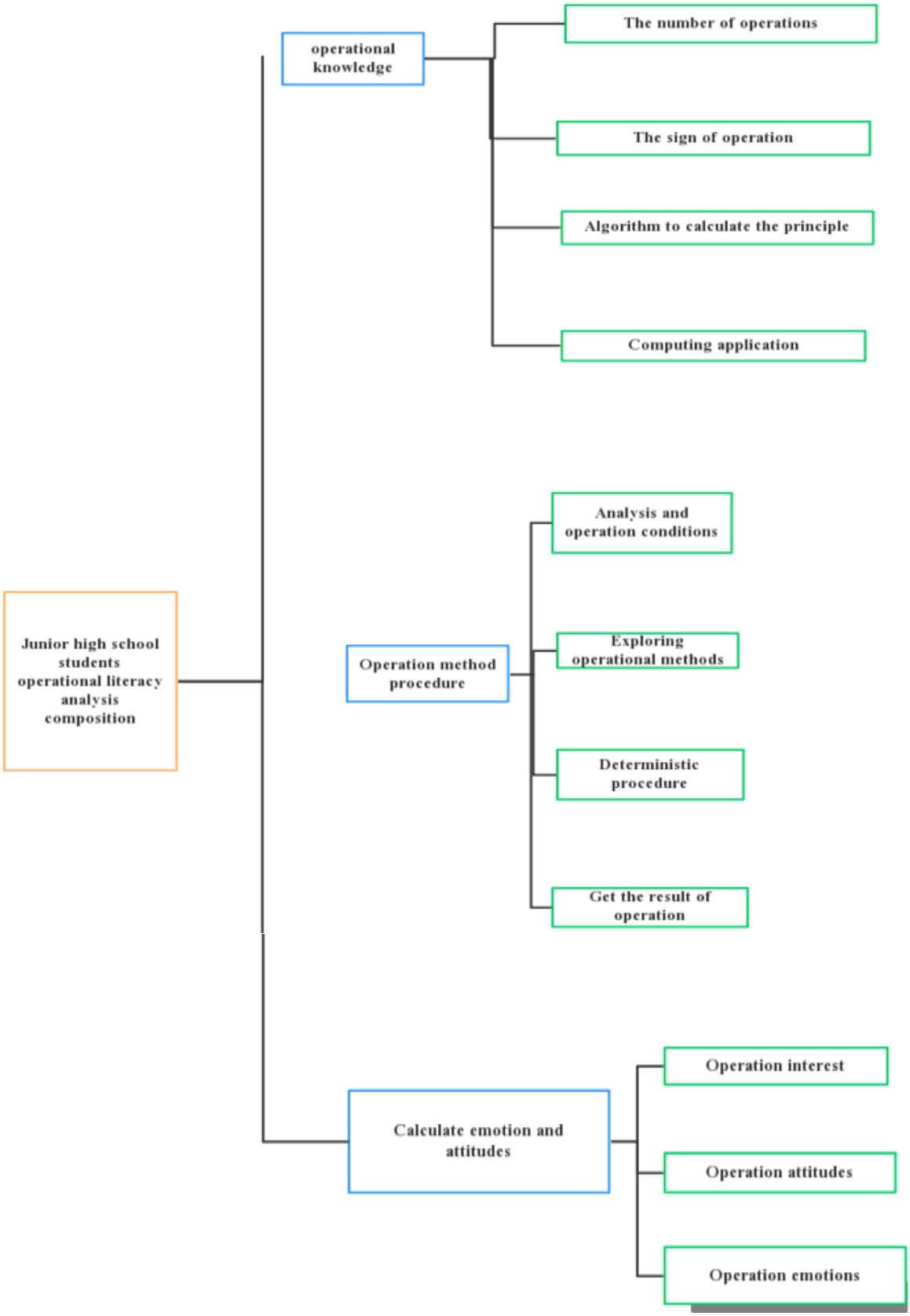
3. *Serious Thinking Patterns*

In the process of learning mathematics, students gradually formed their own thinking system, like to use their own habit of thinking to think about all the problems. This will lead to the inertia of students' thinking, they don't like innovation, and they don't want to use their brains to calculate, which will affect the process of calculation. Moreover, they may want to give up some complicated calculation problems, or make calculation more complicated and difficult with their own way of thinking, and gradually lose interest in operation.

4. *Teacher Reasons*

In the interview, the teacher said is every math teacher is in the classroom with a mission, each class for imparting new knowledge, not is the focus of the mathematics, because the time is short steps classroom will ignore many operation, can let students themselves after class complete, operation steps directly omitted, don't have enough time to perform arithmetic operations. This is something that many teachers miss. Many students for math can't timely correcting errors, because they didn't get the correct detailed calculation process, makes the students operation ability can not be effectively improved, and teaching material of light weight on the one hand, teachers teaching, some teachers make workbook, so that the students are no longer interested in mathematics learning, the learning enthusiasm fade away.

According to the mathematical operation characteristics of junior high school students, the analysis of junior high school students operational literacy block diagram. This is shown below



Aiming at the research of students' computing ability, I collected the corresponding wrong problem cases through the tutoring of extracurricular students, analyzed the causes of their mistakes, found out the types of operational errors, and found the corresponding coping strategies, so as to improve students' mathematical operation ability.

B. *The Strategy of Cultivating Students' Mathematical Operation Ability*

1. *Pay Attention to the Foundation and Help Students Grasp the Laws of Mathematical Operation*

Mathematics is a comprehensive subject. In the classroom teaching of mathematics, it is necessary to fully mobilize students' original knowledge and corresponding practical ability of operation, so as to better understand mathematical knowledge and grasp the essence of mathematics. There are many contents involved in mathematical calculation, which requires students to make full use of mathematical concepts and corresponding algorithms to conduct mathematical operations. However, from the perspective of students' completion of calculation problems, there are still many students with a single pen-arithmetic method and unclear understanding of some concepts and principles, leading to frequent errors in calculation. The purpose of strengthening students' basic knowledge training in middle and high school is to cultivate students' comprehensive application ability of mathematical knowledge, clear and clear of mathematical concepts and principles, and gradually cultivate students' mathematical calculation ability. In the process also found some algorithms to solve the problem. The phenomenon of error causes students to math errors, such as the calculation simple rational division occurs some operation law of error, this is typical of math mastery of the knowledge base is not clear, appeared in the process of a high school math problem solving such calculations: 48 present () for the problem of operation I

Many students found that the error solution is similar, are calculated in this way: 48÷ 48. For such a solution, analysis of its causes, most students are affected by the distributive law of multiplication algorithm error. Many students are convinced that their algorithm is not wrong because they have blurred the applicable scope of mathematical laws. However, some students find the wrong point in the process and know that the law of multiplication only applies to multiplication and not to division. A ÷ (b + c) ≠ a ÷ b + a ÷ c in order to effectively improve students' computing ability, teachers should properly guide students to find problems, think independently and solve them independently. It is also possible to use counter-examples to give students a thorough understanding of the distributive property of multiplication. Through this kind of teaching helps the student to correctly my mathematics operation law, thus solved a computation mistake point.

2. *Pay Attention to Training and Comprehensively Improve Students' Comprehensive Ability*

Students' lack of mathematical calculation ability not only affects students' mathematical performance, but also affects students' thinking level and the development of innovation ability to a certain extent. It is necessary to strengthen the training of mathematical calculation to improve the comprehensive ability of students. Especially in the daily learning process, often hear parents, students and teachers do not seriously, careless, resulting in a lot of math mistakes. In fact, the root cause of mistakes is that students do not pay attention to the problem, do not have a clear understanding of things, it is easy to be disturbed by the outside world. High school students are also in a critical period of puberty, with great emotional fluctuations, lack of patience, coupled with the existence of stereotypes and other adverse factors will also limit students' mathematical calculation ability. In high school mathematics teaching, we should pay attention to using scientific and effective calculation methods to guide students to study mathematics, and then improve students' computing ability, and the overall learning quality will be improved comprehensively. We should pay attention to strategies and methods when teaching fraction equations in this math class, so that we can learn efficiently in this class. After explaining the relevant knowledge of fraction, we can give examples of easy to make mistakes. To let the student independently to complete the

problem: for instance, many students hold a pencil immediately began to calculate and complacent, trying to solve with knowledge in this lesson, there are some students for this type of math basic interest, roughly calculated felt cumbersome steps, suddenly lost interest, scribbled calculations, remember to turn on the left side of the equation only multiplied by 6, ignoring the right also need x 6, eventually led to the calculation error. The reason for the mistake of this problem is not the lack of knowledge of mathematical calculation principles, but the lack of patience of students, who felt complicated when seeing the molecular fraction, and lost interest in this problem immediately. For the mistakes caused by this situation, the teacher should correct the students' learning attitude in time, and give a certain self-confidence, take this kind of questions as a type of questions, write down in their own wrong questions, and strike while the iron is hot to find a few similar examples, many times until fully grasp the calculation method. Constant practice increases students' patience and proficiency, thus improving students' comprehensive computing ability.

3. *Pay Attention to Norms and Develop Good Computing Habits*

Students in complete mathematical problem led to the incorrect because there are a lot of math problems in the process, the teacher should let students' error correction, and finishing wrong topic, write every way the cause of the wrong topic clearly, and learn to classify, distinguish each problem is the type of error, such as "lack of patience lead to wrong topic", "copy the wrong questions lead to wrong topic", "foundation calculation error", "operation law of error" and so on. When I was tutoring students, I analyzed the reasons. Many students would say that they were "careless". Then have we ever thought about such a question? One of the most important reasons is that students find math problems boring and uninterested in doing them, so they tend to resist doing them. In the end, they attribute the reason to carelessness. There is another reason why now more and more developed science and technology, all kinds of electronic products has been poured out, one of the most common is the calculator, students directly to use them for convenience, the heart also feel oneself start work also will do, not, as time passes to calculate more strange, ignore the importance of it, causes students to calculate the basic skills of more and more weak. To cultivate students' good computing skills, students should try to master the following three points in the ordinary teaching process:

First, in the calculation should pay attention to "a look, two think, three calculate". "A look" is when we see a math problem, don't rush to do the problem, to be patient to read a word does not miss the problem, see every condition in the problem, every letter, number and operation symbol, that is, to examine the problem carefully. "Second think" want to clear the operation order of the problem and need to use the calculation method. "Three calculations" according to the first two steps of the thinking sequence continue to calculate, be patient.

Second, to develop the habit of careful calculation and good writing, it is necessary to write neatly. Not only to be accurate, but also to constantly standardize their own calculations. If you want to develop a good habit like this, you have to start from daily life. Whether it is usually homework or take the exam to be strict requirements of their own, in accordance with the norms of writing.

Third, we should learn to test independently. When a problem is completed, it should be checked habitually, which requires the teacher to pay attention to demonstration and inspection in the ordinary teaching work, and also to add a step of inspection in the blackboard demonstration, so that students know the importance of inspection, and gradually develop the good habit of inspection. The accuracy rate will improve a lot. Especially

when learning rational number calculation, it is very common to check the method of estimation. For example, in a calculation problem like this :(-5) + (-6) =11, this arithmetic error is obvious, two negative Numbers cannot add up to a positive number, this kind of arithmetic problem can be found through a simple check calculation, make full use of estimation, so that the error can be avoided.

In the process of mathematics learning to master the three aspects of operational ability, but also need teachers and students to work together to complete, teachers and students in the classroom to explain math problems, to be strict requirements of writing, do a clear, complete thinking standard every solution step, and constantly cultivate students to learn the good habit of mathematics. In the test and daily homework grading in strict accordance with the steps to give them a deeper understanding of the standard steps. The formation of these habits in order to let students overcome the psychological barriers of learning mathematics, improve the ability of mathematical operation, master the method of learning mathematics. Comprehensively improve the ability and skills of learning, so that students are willing to learn mathematics, a strong interest in computing.

4. *Cultivate Computing Interest and Stimulate Learning Desire*

Mathematics is a subject that studies the concepts such as quantity, structure, change, space and information. In the process of learning mathematics, it is hard to avoid being boring and boring, and the calculation in mathematics makes students lose interest. Dealing with the boring Numbers and symbols, and teachers often neglect this process in class. The lack of interest leads to the continuous decline in students' computing ability and accuracy. Encounter calculation problems will not carefully review, do not go to careful analysis of the problem, also ignored the reasonable law of operation. The teacher should carefully prepare the lesson as far as possible the mathematics and the life actual relation, increases the mathematics classroom the interest. For example: 1 + 2 + 3 + 4 + 5 + 6 + 7... +100 = 5050, a lot of students look at the problem are confused, do not know where to start, one by one add up is very troublesome, the teacher gave the formula, the students quickly put in the solution to this problem, but the students are very confused, how did this come? Even if can also through rote memorization, still have no interest, more boring. If we change the way in class, will we get different results? Teachers can tell stories about gauss: gauss started school at the age of seven. At the age of 10, he was enrolled in a math class, a first for children who had never heard of arithmetic before. Mathematics.

The teacher was buettner, who also played a role in gauss's growth.

One day, the teacher assigned a problem, 1 + 2 + 3... So we go from 1 to 100.

Gauss quickly figured out the answer. At first, gauss's teacher, butner, was not convinced gauss had the right answer. Gauss says the answer is 5050, gauss says 1 + 100 = 101, 2 + 99 = 101... If you add 1 to 100 you have 50 of these Numbers, so 50X101 minus 5050. Butner was impressed. He specially bought the best arithmetic book from Hamburg and gave it to saying, "you have overtaken me, and I have nothing left to teach you." then established a sincere friendship with butner's assistant bartels, which lasted until died. They studied together and helped each other, and gauss began the real work of mathematics.

This way to explain the problem, will greatly stimulate students' interest in learning, but also unknowingly enrich their extracurricular knowledge, boring math problems will immediately become vivid, image, interesting, will also provide some inspiration for students to do the problem, they will be more interested in reading math, improve the efficiency of math class.

II. CONCLUSION

The ability of mathematical operation is an important ability that students must have. To improve students' mathematical operation ability, we should not only pursue the tactics of examination, but also integrate the ability of logical thinking, abstract ability, memory ability, observation ability, understanding ability, logical reasoning ability and summarizing ability. Through the survey results of the questionnaire and test paper, the problems in the mathematical operation ability of senior high school students are mainly reflected in three aspects: students' learning process, teachers' teaching process, and the influence of teaching environment on students. In order to improve high school students' mathematical operation ability, it is necessary to strengthen the practice of basic knowledge, pay attention to the topic review training, elaborate relevant knowledge, strengthen the thinking training, pay attention to the standardization and accuracy of daily exercises, develop the habit of testing results, and skillfully use mathematical thinking methods.

Clever use, pay attention to the cultivation of non-intellectual factors, pay attention to students' learning psychology of mathematics, cultivate their interest in learning, develop students' personality through the ability of operation, practice in the process of operation can make perfect, flexible.

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