

High School Students under the Integrated Teaching Mode of Lecture and Practice Research on the Cultivation of Mathematical Operation Literacy

Hui Xu^{1*} and Guangfen Ruan²

^{1,2}Department of Mathematics, School of Science, Yanbian University, Yanji, Jilin, China.

*Corresponding author email id: sxxuhui@ybu.edu.cn

Date of publication (dd/mm/yyyy): 20/04/2022

Abstract – Under the circumstance of the transformation of the main contradiction in our society and the gradual strengthening of the comprehensive national strength, the new curriculum reform has followed. My country's mathematics education must meet the new requirements of improving the comprehensive quality of the people and cultivating high-quality talents. In the 2017 edition of the 2020 revision of the "General High School Mathematics Curriculum Standards", China proposed six core competencies to be developed in the study of mathematics. The acquired value judgment standards necessary to adapt to social life and work, mathematical operation literacy is the ability that students must master in life and study, and is the necessary foundation for learning the subject. It plays a pivotal role in students' mathematics learning. Basic and excellent computing ability can escort the learning of mathematics, and good computing literacy is conducive to cultivating students' scientific and rigorous mathematical thinking quality. The development of good computing literacy not only depends on the unilateral efforts of students, but also has a close relationship with teachers' classroom teaching and teaching methods. Based on the teaching mode of the integration of teaching and practice, this paper uses the literature research method to carry out research on the cultivation of high school students' mathematical operation literacy. The research results show that the teaching mode of teaching and practice integration is helpful to improve students' correct understanding of operation objects, accurate selection of operation rules, etc., and is conducive to improving students' mathematical operation speed, operation efficiency and accuracy of operation results.

Keywords – Teaching Mode, Mathematical Operation, Core Literacy, Lecture and Practice Integration, Mathematical Operation Literacy.

I. INTRODUCTION

With the vigorous development of the social economy, the accelerated speed of technological update and the growing comprehensive national strength, mathematics is widely used in agriculture, commerce, industry and commerce and other fields, and mathematics plays an increasingly important role in people's lives. Therefore, mathematics learning in high school will also face new challenges. Since mathematical operation literacy has been incorporated into the core literacy of high school mathematics, society, schools and teachers should pay more and more attention to cultivating students' mathematical operation literacy.

Mathematical operation is a necessary ability for mathematics learning, which has the characteristics of complexity, hierarchy and logic [1]. Students need to face all kinds of challenges and setbacks in the process of mathematics learning, but due to the pressure of further studies and examinations, students must overcome the difficulties and setbacks they encounter, so they will be afraid of learning mathematics. Students in this complex psychological state for a long time may cause students to resist mathematics. Mathematical operation is not a simple mechanical imitation, but a reflection of students' comprehensive ability.

Therefore, teachers should choose a teaching mode suitable for students according to the mathematical knowledge that students have mastered, the way of thinking about mathematical problems and the

characteristics of students, so that students can have a solid grasp of mathematical operation literacy, meet the requirements of the course objectives, and enable students to gain openness the key secrets of the mathematical world and mathematical thinking, forming a practical and diligent mathematical operation habit and striving for excellence in mathematics learning attitude, realizing the transformation from perfunctory learning to serious and diligent learning now, deeply influenced by mathematical knowledge, indulging in the mathematical world. Among them, it arouses students' curiosity for mathematics, prompts students to yearn for the exploration of mathematical mysteries, and is willing to think about the causes of mathematical problems, thereby improving the efficiency of learning mathematics.

The development of mathematical operation literacy not only depends on students' own efforts, but also has an inseparable connection with teachers' teaching mode. When teaching mathematics knowledge points, teachers should choose the appropriate teaching mode based on the actual situation of students and the characteristics of the knowledge points taught, which can make the classroom achieve unimaginable teaching effects. The teaching mode of teaching and practice integration not only pays attention to teachers' teaching of knowledge, but also pays attention to students' practice of knowledge points. This mode can well meet the requirements of the new curriculum reform for high school students' mathematical operation literacy. Based on this, this paper studies the mathematical operation literacy of high school students based on the teaching mode of teaching and practicing integration.

II. RESEARCH QUESTIONS

Most of the mathematical operation literacy of high school students in my country has problems [2], which are mainly reflected in the following aspects: Students' computing ability needs to be strengthened. Because mathematical operations are mainly composed of three parts: operation of specific numbers, algebraic operations with letters, and logical operations, many students will habitually skip algebraic operations with large numbers, many operation steps, and letters. , or with the help of problem-searching software and calculators, students develop dependent thoughts, resulting in the phenomenon of students' poor computing ability. In the process of learning in high school, students need to accept and understand a large number of complex and specialized mathematical languages and symbols in a short period of time, which makes it difficult for students to grasp and understand the exact meaning and practical application of mathematical language and symbols. When there are too many questions, you will feel afraid and give up the question. Since the solution of mathematical problems requires not only careful observation and careful calculation, but also students should always insist on consolidating and strengthening their operational literacy, so as to achieve the purpose of tempering and improving their own mathematical operations [2].

The potential of analyzing and understanding the meaning of the question remains to be explored [3]. When faced with mathematical problems involving multiple knowledge points and complex language of question design, it is impossible to accurately and specifically analyze the meaning of the question, and it is impossible to quickly sort out the implicit relationship between the question design and the result. Therefore, it is impossible to accurately find the operation object and operation target. , resulting in students unable to choose the correct operation method and algorithm, confusing operation logic, careless operation process, so that mistakes frequently occur in solving mathematical problems, and correct operation results cannot be obtained.

Doing questions blindly, failing to formulate a reasonable exercise plan, failing to form scientific and standar-

-dized computing habits and clean, tidy and well-organized writing habits [4]. The topics corresponding to high school mathematics knowledge include basic questions, improvement questions, final questions, etc. The number of knowledge points involved in the questions at different levels and the difficulty of the questions are also different. Most students do the questions in order to cope with their homework and reduce their own guilt. They cannot combine exercises of different types of questions according to their weak points and knowledge points that need to be consolidated and strengthened. I always do the questions that I don't know, and I often do the questions in a simplified way, only writing out the problem-solving ideas and ignoring the problem-solving steps. When carrying out specific mathematical operations, the operation steps are chaotic, and there is often a phenomenon that the same problem-solving process appears on different scratch papers, resulting in frequent errors in the problem-solving process of students.

The study pressure is high, the academic tasks are heavy, and the summary of computing experience is ignored. Students need to complete heavy and complex studies within a limited study period, and cannot think deeply about various exercises, which leads to spending a lot of time thinking when encountering similar problems. In addition, in the case of limited teaching time, teachers have to tend to explain the problem-solving ideas and problem-solving skills of mathematical problem-solving, ignore the practice of problem-solving steps and problem-solving procedures, and despise the cultivation of operational literacy, which leads to the need for students to be mathematically comprehensible. Consolidate and improve. In order to save class time, some teachers usually focus on the final result, compress the process of demonstrating the steps of solving the problem, and ignore the summary of the problem-solving experience. These reasons are likely to lead to low mathematical literacy of students, resulting in a corresponding decline in the accuracy and speed of problem-solving.

Based on the above problems, this paper mainly studies the influence of teachers' teaching mode on students' mathematical operation literacy, and proposes strategies that teachers can take in the process of cultivating students' mathematical operation literacy under the teaching mode of teaching and practicing integration.

III. LITERATURE REVIEW

Hongquan Jian believes that mathematical operation ability is mainly determined by the ability to master theorems and definitions, and to accurately choose the operation rules and operation formulas; the ability to choose the operation method that fits the meaning of the question; the ability to properly apply mathematical thinking and mathematical methods and the ability to estimate the results of the question Competence composition [5]. Shizao Zhang believes that mathematical operation is the process of selecting the appropriate algorithm and formula for deductive reasoning for the specific operation object to achieve the goal of solving [6]. Caihan Cao believes that mathematical operation ability mainly consists of the ability to accurately and quickly extract information, the ability to select appropriate algorithms and formulas for different types of problems to solve problems, the ability to flexibly change operation ideas and methods according to known problem information, reduce operation steps and simplify operations. The ability of the process and the ability to accurately memorize the types of questions and their corresponding solutions constitute [7]. Shuhuan Lu believes that mathematical operation ability is composed of the ability to orientate the problem, the ability to synthesize the problem, the ability to quickly calculate and reason, the ability to optimize the operation process and method, the ability to solve problems using divergent thinking, and the ability to memorize formulas and th-

-eorems [8].

Mathematical operation literacy is a means of clearly analyzing mathematical problems, accurately judging and mastering mathematical operation objects, rationally and scientifically selecting operation rules and applying concise and clear mathematical operation methods to solve mathematical problems [9]. Mathematical operation literacy is a complex composed of various abilities, including the quality of mathematical thinking, the emotional attitude of mathematics, and the basic skills of mathematics [10]. Jianyue Zhang believes that the basic requirements for cultivating and implementing students' computing literacy are: students can not only calculate, but also can calculate quickly and accurately. It is necessary to strengthen students' mathematical operation ability in a multi-angle, all-round and high-efficiency manner, and consolidate students' mathematical operation. Basic skills, so that students can deeply understand the profound meaning and charm of mathematical operation literacy [11].

In the literature research on mathematical operation ability and mathematical operation literacy, it is found that mathematical operation literacy has richer and profound implications, and is the product of expansion, extension and development on the basis of mathematical operation ability. Theoretical significance and more specific operability.

IV. THEORETICAL BASIS

A. *Mathematical Operation Literacy*

Mathematics plays an important role in cultivating students' logical thinking, scientific awareness, rigorous attitude towards knowledge and promoting students' intellectual and physical and mental development. Mathematics is the core subject of basic education in my country. It is an abstraction and expression of the real world. Using the perspective of mathematics to observe and analyze things in real life can more accurately reveal the relationship between real things and cultivate students' mathematical thinking quality. Exercise students' ability of deductive reasoning and model construction [9]. My country's 2017 edition of the 2020 revision of the "General High School Mathematics Curriculum Standards" put forward the core literacy of mathematics, and the core literacy has made new regulations on the learning objectives that students should achieve in this course, showing that students learn this subject. The basic knowledge and basic skills to be mastered after the course, students can learn to use correct values and different perspectives to view study and life in the process of developing the core literacy of the subject, cultivate students' positive attitude, master the ability to overcome difficulties in learning and life. Such difficulties and setbacks are crucial to the character [9].

The specific meaning of mathematical operation literacy is: according to the operation object in the problem, scientifically select mathematical operation rules, design rigorous operation ideas to solve mathematical problems, and play an irreplaceable role in solving mathematical problems, mainly including: Accurate identification of operation objects, explore and form a concise and systematic operation idea, understand and master the deduction process and application conditions of the algorithm, clearly remember and use operation symbols, rigorous and scientific operation procedures, select accurate operation methods, and obtain operation results efficiently and accurately [9]. Mathematical operation literacy is mainly composed of three parts: algebraic operations with specific numbers, algebraic operations with letters, and logical operations.

Mathematical operation is the reasoning process of selecting the corresponding rules and theorems, using ded-

-uctive reasoning to change the form of the operation formula, and obtaining the operation result [12]. In understanding and analyzing the concepts and theorems of mathematical operation literacy and mathematical operation ability, it can be found that mathematical operation literacy is the expansion and continuation of mathematical operation ability under the requirements of the new curriculum goals [12]. The core competencies that mainly constitute mathematical operation literacy are: the ability to process and analyze topic information, the ability to comprehensively use a variety of operation methods to solve problems, the ability to understand mathematical concepts and mathematical formulas and the process of formula derivation, and the use of mathematical viewpoints to observe and explain practical situations problem ability [13].

Mathematical operation ability plays an irreplaceable role in solving mathematical problems. It is the most important research object in mathematics. Not only is mathematical operation very important, but a solid grasp of mathematical operation has a positive effect on students' formation of mathematical thinking, which is beneficial to students. Form a rigorous and standardized quality of thinking about mathematical problems, and develop a mathematical spirit of being diligent and realistic and not afraid of difficulties and dangers [9].

B. Lecture and Practice Integrated Teaching Mode

Teaching occupies a central position in school activities and is the center of school work. Teaching effect is an important indicator for evaluating school education activities. Teaching, which gives full play to the leading role of teachers, and learning, which attaches great importance to students' subject status, together constitute the school's teaching activities, which have the characteristics of bilateral nature, and the teaching mode connects teachers and students. Set up a reasonable teaching mode in order to achieve teaching goals. If there is student learning, there must be student practice. Without reasonable and targeted practice, students cannot efficiently master the knowledge points they have learned and cannot accurately use the knowledge points to solve problems, resulting in students unable to form proficient mathematical skills. So that students cannot accurately identify the learned knowledge points in complex and comprehensive mathematical situations.

The teaching mode of the integration of lecture and practice is to run knowledge explanation and exercises throughout the whole classroom learning, fundamentally pay attention to mathematical knowledge, attach importance to the development of mathematical skills, and train the thinking and character of mathematics; The process of scientifically imparting systematic mathematical knowledge to students enables students to have a solid grasp of mathematical knowledge, form a teaching structure for mathematical skills and improve mathematical operation ability [14,15].

The goal of mathematics teaching is also the core factor of the integrated teaching mode. Therefore, when using this mode, the curriculum objectives and the school's training objectives should be taken as the main direction, the concept of mathematics education should be implemented, the fortress of mathematics knowledge should be established, and mathematics skills should be mastered proficiently., consolidate the foundation for building a building of mathematical knowledge, use the teaching mode of teaching and practice integration, highlight the people-oriented educational concept, let students join the mathematics classroom with full enthusiasm and high fighting spirit, and also attach great importance to teachers in the teaching process. It can guide and inspire students' thinking in a timely manner, help students overcome mathematical problems, and guide students to transition from solving one problem to solving multiple problems, so as to achieve the goal of solving similar problems. It is necessary to integrate the teacher's professor with the students' practice, realize

the joint promotion of explanation and practice, and achieve the expected teaching goal with quality and quantity on the basis of completing the teaching goal [14].

The teaching elements to be possessed by this teaching model mainly include: goals related to knowledge and values obtained through mathematics learning; teachers explain the teaching process integrated with students' practice; typical examples used in the teaching process. The conditions that this mode needs to meet are: typical cases, clear goals, and concise usage process [14].

V. RESEARCH METHODS

This paper uses the method of literature research. In China National Knowledge Infrastructure, I searched and read documents related to core mathematics literacy, mathematical operation literacy, mathematical operation ability, and the integrated teaching model of lectures and practice, and reviewed the relevant documents of high school mathematics issued by the Ministry of Education and professional books related to mathematics teaching. Research with your own thinking.

VI. REASONS FOR PROBLEMS IN MATHEMATICAL LITERACY OF HIGH SCHOOL STUDENTS

The reasons for the problems in the mathematical operation literacy of high school students in my country are different: Analysis from an objective point of view: First of all, students' mathematical operation literacy is formed by different aspects of ability and thinking, which reflects the composite ability to be mastered in learning mathematics, such as the ability to effectively extract topic information, the relationship between observation and comprehensive analysis of the problem design. The ability of interrelation, the ability to use reasoning and transformation flexibly, the ability of spatial construction and imagination, etc. If these abilities are defective, then the results of the operation will be problematic [16]. Secondly, the operation steps of high school mathematics problems are complex, and the requirements for operation logic are relatively high, which leads to increased operation difficulty and difficult to understand the operation object; there is no in-depth understanding of the meaning and implied ideas of concepts, and the essence is not touched [17]. Third, in the study of mathematics courses in high school: the operation object changes from concrete to abstract, the operation rule changes from simple to complex, the operation variable changes from single to multiple, and the operation dimension changes from plane to space; not only that, high school mathematics curriculum The vector and complex number are also introduced on the basis of the original operand, and the extension from scalar to vector and real number field to complex number field is realized. Fourth, due to the difficulty of mathematics and the rich knowledge points in the high school stage of our country, different knowledge points are intertwined and intertwined, forming an intricate knowledge structure, which leads to the heavy operation process, the increase of operation steps, and the diversification of operation methods. It also caused a change in the thinking of mathematical operations. At the same time, the limited teaching time leads to a large classroom capacity, and most teachers have to tend to the teaching of theoretical knowledge, while ignoring students' mathematical operation practice, resulting in frequent occurrence of students who can master the knowledge points but do not do the right questions; and under the influence of absolute evaluation, in order to allow students to report satisfactory learning results in a short period of time, teachers will consciously cultivate students' problem-solving skills and answering ideas, thereby ignoring the specific steps of mathematical operations, resulting in the problem-solving process becoming very rough.

Analysis from a subjective point of view: First, teachers tend to underestimate the role of mathematical operation literacy in mathematics learning, fail to fully analyze and find the factors that lead to poor mathematical operation results of students [16], and fail to take measures to improve students' mathematics according to the actual situation of students. Operational level teaching mode. Secondly, students do not face up to the importance of mathematical operations and the core role of mathematical operations in solving mathematical problems. They roughly think that mathematical operations can be completed as long as they are careful result [18]. Third, most students lack the spirit of overcoming difficulties in their usual arithmetic exercises. When they encounter too many arithmetic steps, difficult arithmetic rules, and unclear problem-solving ideas, they often choose to give up or seek help from their classmates. Some students even choose to give up. They will use question search software or reference answers to get the correct answer. These study habits that need to be improved will cause negative consequences for students' operational literacy, and it is impossible to improve their mathematical operational literacy [19, 20]. Finally, due to the heavy workload of high school homework, a lot of homework after school, and students in a passive and passive learning state, they will use a perfunctory attitude to complete their homework, without the energy and time to calm down and analyze the operation procedures and steps of mathematical problems. One of the reasons why students' computing literacy needs to be improved [16].

The above reasons have had a significant impact on the mathematical operation literacy of high school students, and they are also the difficulties and challenges that students must meet in their high school learning career.

VII. CULTIVATION STRATEGIES FOR MATHEMATICAL OPERATION LITERACY

When teachers use the teaching mode of lecture-practice integration to teach knowledge points, they can select typical cases suitable for students according to the following methods, and design practice questions that are suitable for students according to students' thinking quality and actual acceptance ability, so as to cultivate students' mathematical operation literacy and improve Students' ability to use and understand mathematics in all aspects.

Focus on cultivating students' semantic understanding ability and comprehensive analysis ability of question meaning, and improve the efficiency and accuracy of reading questions: Most of the high school mathematics questions involve multiple knowledge points, and different abstract mathematical symbols are often used in the questions. The process of understanding the meaning of the question has caused many difficulties, which is a challenge that must be faced in the learning career. Therefore, teachers should focus on cultivating students' ability to understand the meaning of the question, and teach students to understand and analyze the relationship between the information of the question through the specific process of guiding and demonstrating the analysis of the question in class, so as to deduce the knowledge points that need to be used to solve the problem. Algorithms, deepen students' understanding of mathematical symbols, and firmly grasp the actual meaning of mathematical symbols. Example 1: If the set $A = \{x|x^2 - 5x + 4 \geq 0\}$, $B = \{x|x < 5\}$, find the set $A \cap B$. When explaining this topic, the teacher first leads the students to analyze the meaning of the question, sort out the interrelationship of the information in the question, lead the students to review the mathematical symbols related to sets, recall the meaning of the symbols, and deepen the students' memory, making it clear that the operation goal of this question is to seek Find the intersection of set A and set B; secondly, since set A needs to be solved

by solving a quadratic inequality in one variable, the operation idea of this problem is: first find the range in set A, and use the number axis to calculate the range of the set in the question. Present it, and find out the scope of common inclusion, which is the solution of the problem. The specific operation steps are: because $x^2 - 5x + 4 \geq 0$, $(x - 4)(x - 1) \geq 0$, the value range of x is $x \leq 1$ or $x \geq 4$, that is, the set $A = \{x | x \leq 1 \text{ or } x \geq 4\}$, and then use the number axis to represent the set A and the set B, that is, the intersection of the set A and the set B, then: $A \cap B = \{x | x \leq 1 \text{ or } 4 \leq x < 5\}$, in which special emphasis should be placed on whether the set is open or closed. In the process of explaining the topic, it is necessary to carry out targeted exercises on the knowledge points that students have doubts, so that the exercises can be integrated into the topic explanation; when solving one-dimensional quadratic equations, it is necessary to prepare equations that apply different root-finding methods, so as to deepen students' understanding of one-dimensional two-dimensional equations. Understand and memorize the knowledge points involved in the sub-equation, in order to achieve the goal of cultivating students' ability to analyze and solve problems.

Emphasis on the reasoning process of arithmetic rules and arithmetic formulas, helping students to understand and memorize related arithmetic formulas and arithmetic rules, reasonably determine the operation ideas, and improve students' ability to cultivate algebraic expressions containing letters. Teachers should pay attention to the reasoning process of an algorithm, explain to students the mathematical knowledge points and mathematical thinking used by the algorithm, and demonstrate the specific steps of the operation, which will help improve students' ability to use mathematical knowledge for deductive reasoning and accurately identify the conditions for applying the law. It enables students to master the principles of algorithms more deeply, so that students can quickly and accurately choose algorithms when solving problems. The outstanding features of computing ability are clear and accurate operation objects, correct and reliable operation results, organized operation ideas, rigorous and meticulous operation process logic, and concise and clear operation steps. When using the relevant knowledge of mathematical operations to analyze and solve problems, it is necessary to comprehensively analyze the known conditions of the problem, clarify the object of the problem, select the correct algorithm, design an appropriate operation program, and implement specific operation steps. Mathematical operation ability is a comprehensive reflection of the ability to use knowledge, operate operation methods, and divergent thinking ability. When explaining the algorithm of logarithm: $\log_a M + \log_a N = \log_a MN$ ($a > 0$ and $a \neq 1$, $M > 0$, $N > 0$), the teacher can first explain the algorithm of exponential function for derivation, the specific process is: set $a^r = M$, $a^s = N$, then $\log_a M = r$, $\log_a N = s$, it can be deduced that $\log_a M + \log_a N = r + s$ (1); and because $a^r \cdot a^s = a^{r+s} = MN$, so $\log_a MN = r + s$ (2); Combining equations (1) and (2) can get the logarithmic algorithm: $\log_a M + \log_a N = \log_a MN$. Teachers demonstrate the reasoning process of algorithms to students, which not only helps students understand the specific meaning of algorithms and consolidates students' memory of algorithms, but also improves the efficiency of students' accurate selection of algorithms when solving problems. When teaching the arithmetic rules of exponents, teachers can set up several specific exponent operations to help students consolidate exponent operations; after the explanation of logarithmic operations, they need to choose hierarchical and targeted topics according to the actual situation of the students to consolidate the students. Learning about knowledge points.

Cultivate students' mathematical thinking quality that is not afraid of difficulties, and improve mathematical operation thinking: Since mathematical operation is not a simple calculation process, and the calculation results are unique, it is necessary to comprehensively use students' abilities in all aspects to improve students'

application of basic mathematical knowledge and basic skills Ability. In the classroom, teachers should pay attention to the cultivation of students' thinking ability, improve students' logical operation of mathematical symbolic language, use various methods to solve problems and deduce the thinking ability of proof; Changeable problem-solving thinking; targeted training of students to transform their thinking, classified discussions, combination of numbers and shapes, and summarization of mathematical thinking, and improve the accuracy of mathematical operations; pay attention to cultivating students to actively face difficulties, have the courage to challenge, and dare to operate with mathematics the quality of struggle allows students to develop a positive attitude towards mathematical operations. For example: when teachers explain the zero point problem of a quadratic function in one variable, they can transform it into the problem of finding the root of a quadratic equation in one variable, or draw an image of the function and observe whether the image and the x -axis intersect; When the size of the angle is determined, the line can be translated into a plane that is easy to solve, or the direction vector of the line can be found, and the surface angle of the line can be solved according to the direction vector of the line and the sine of the normal vector of the plane.

Cultivate the transformational thinking of students' mathematical problems, learn to transform different types of mathematical problems into operational problems, and improve students' ability to calculate specific numbers: Mathematical operations exist in the entire process of high school mathematics learning and are the foundation of learning mathematics. Therefore, Teachers should teach students to use different mathematical ideas and different knowledge points to solve the same problem and analyze problems from different perspectives, so as to cultivate students' divergent thinking. Example: When solving the size of the dihedral angle, it can be converted into the angle formed by the normal vectors of the two planes, and the size of the angle can be deduced by using the cosine value of the angle; when solving the cosine value of the sum of the two angles, you can directly It can also be solved by means of the unit circle.

Taking students' hobbies and hobbies as the insertion point, implement teaching according to their aptitude, let students generate curiosity and yearning for mathematics from their hearts, indulge in the process of learning and exploring mathematical knowledge, and feel the charm and deep meaning of mathematics. Teachers should combine the age of the students. According to the stage and the actual situation, the students' hobbies and mathematical knowledge are combined, and mathematical problems are set reasonably to achieve the goal of interest transfer, so that students fall in love with learning and enhance their interest in mathematical operation literacy. For example, when teachers explain the line-plane vertical theorem, they can use the relationship between the flagpole and the plane where the shadow is located during the day to import; or, when explaining the arrangement and combination, they can use the e-sports that students like to arouse the curiosity of students. How many teams can be formed by the students in the class, and calculate how many games each team needs to play, etc.

VIII. CONCLUSION

Through the research of this paper, it is found that teachers adopt the teaching mode of teaching and practice integration, which is conducive to highlighting the dominant position of students in the classroom, so that students can actively participate in classroom teaching activities. Students' mathematical operation literacy can be improved under the cultivation of the teaching mode of teaching and practice integration. When faced with complex problems, students can quickly clarify their thinking, grasp the key information in the problem and the

connection between knowledge points, accurately determine the operation object and operation target, choose the correct algorithm, and carry out rigorous and standardized mathematical operations; at the same time, In the teaching process, teachers can lead students to analyze the calculation ideas of problem solving, design reasonable calculation procedures, demonstrate correct and rigorous calculation steps, and standardize students' problem-solving ideas and problem-solving process; due to limited classroom time and the pressure of classmates, Students will continue to speed up their calculation speed. Through long-term classroom training, it is beneficial to improve the accuracy and efficiency of students' mathematical operations. At the same time, students' thinking agility and comprehensive analysis ability can also be effectively improved, allowing students to experience learning mathematics. The joy of learning and the beauty of mathematics, develop a practical, diligent, and joyful learning attitude and a mathematical spirit of tireless learning, perseverance, and courage to face difficulties.

(Note: The formulas in the text are all entered using the formula editor, including some Greek letters.)

REFERENCES

- [1] Zhijian Ke. Research on the cultivation strategies of high school students' mathematical operation ability based on core literacy [J]. Exam Weekly, 2021(75): 58-60.
- [2] Yongfu Wu. Cultivation of mathematical operation ability of high school students' core mathematical literacy [J]. Science Enthusiasts (Education and Teaching), 2021(04):90-91.
- [4] Meijuan Hu. Investigation and research on mathematical operation literacy level of senior two students [D]. Hebei Normal University, 2021.
- [3] Duoyu Chen. Investigation and research on the current situation of mathematical computation ability of senior one students [D]. Nanjing Normal University, 2017.
- [5] Hongquan Jian. The composition and training strategies of mathematical operation ability in high school [J]. Reference for middle school mathematics teaching, 2000 (Z1): 35-37.
- [6] Shizao Zhang. Middle school mathematics pedagogy. First edition. Beijing: Higher Education Press, 2007.
- [7] Editor-in-Chief Cao Caihan. Encyclopedia of Chinese secondary school teaching. Mathematics Volume [M]. Shenyang: Shenyang Press, 1991.
- [8] Xue Wang. Research on the cultivation strategy of high school students' mathematical operation ability [D]. Beihua University, 2021.
- [9] Ningzhong Shi, Shangzhi Wang. Interpretation of the general high school mathematics curriculum standards (2017 edition and 2020 revision) [M]. Higher Education Press, 2020(11): 121-125.
- [10] Hanxiang Deng. Investigation on the current situation and countermeasures of mathematical operation literacy of high school students [D]. Tianjin Normal University, 2021.
- [11] Jianyue Zhang. What should be emphasized in mathematics literacy in high school [J]. Mathematics for Primary and Secondary Schools (High School Edition), 2016(6):66.
- [12] Mingmin Weng. Research on the cultivation strategies of high school students' mathematical operation literacy [D]. Fujian Normal University, 2019.
- [13] Rongrong Chen. Research on the current situation and countermeasures of the cultivation of high school students' mathematical operation literacy [D]. Southwest University, 2021.
- [14] Xiaoya He, Jing Yao. Middle School Mathematics Teaching Design (Third Edition) [M]. Beijing: Science Press, 2020(07): 97-101.
- [15] Xuefen Zhang. Talking about the combination of lecture and practice in teaching [J]. Curriculum Education Research (New Teacher Teaching), 2012, 1(2): 152-153.
- [16] Bingyou Cao. Optimizing the teaching mode to improve mathematical operation literacy-taking the model teaching of Mathematical Thinking as an Example [J]. Reference for Middle School Mathematics Teaching, 2021(22):72-75.
- [17] Huagao Li. Research on the cultivation strategies of high school students' mathematical operation ability [J]. Western Quality Education, 2019, 5(07): 79-80.
- [18] Kaicheng Han. Investigation and Research on the Status Quo of High School Students' Mathematical Computation Ability [D]. Yangzhou University, 2020.
- [19] Xintong Liu. Research on the current situation and improvement strategies of high school students' mathematical operation ability [D]. Liaoning Normal University, 2021.
- [20] Yuanqiang Chen. Problems, Cause Analysis and Countermeasures of High School Mathematical Operation Literacy [J]. Journal of Fujian Institute of Education, 2021, 22(05): 49-51.

AUTHOR'S PROFILE



First Author

Hui Xu, his major is mathematics. He is now an associate professor in the Department of Mathematics, School of Science, Yanbian University, and he is a master's tutor. His main research direction is mathematical education technology, mathematical modeling and intelligent algorithm, Yanji, China.



Second Author

Guangfen Ruan, was born in August, 1998, in Guizhou province of China. Now she is studying in the subject teaching (mathematics) of Yanbian University's Faculty of Science, Yanji, China.