

Research on Teaching Mathematics in Middle School Based on Core Literacy

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Abstract: This article studies high school mathematics core literacy and explores the teaching methods of middle school mathematics under the background of core literacy. This article first expounds and studies the connotation of middle school mathematics core literacy, and puts forward the mutual relationship between mathematics literacy. In view of the requirements of core literacy, middle school mathematics teachers should strengthen the status of students as the main body and actively guide students. Teachers help students to form a good habit of summing up, and implement teaching strategies in accordance with their aptitude. Teachers carry out mathematical experiments to enhance students' interest in mathematics actively.

1. Introduction

With the continuous development of society, mathematics, as a basic subject, plays an important role in social progress and scientific development. Now we have entered the era of big data, mathematics is closely related to us. Therefore, the high school mathematics curriculum standard was reformed in 2017. This reform highlights the function of teaching and educating people, and implements the basic task of cultivating people by virtue. In the general high school mathematics curriculum standard (2017 Edition), the part of high school mathematics core literacy has been added, which shows that mathematics core literacy plays a guiding role in mathematics learning and teaching. The proposal of core literacy emphasizes more on the cultivation of students' comprehensive quality than the acceptance of examination oriented education.

2. The Connotation and Relationship of Middle School Mathematics Core Accomplishment

Mathematics core literacy is a kind of comprehensive ability acquired through mathematics learning. This kind of ability is mainly reflected in the students' personal quality, knowledge and ability, emotion and attitude. According to the general high school mathematics curriculum standard (2017 Edition), the core literacy of mathematics discipline includes: mathematical abstraction, logical reasoning, mathematical modeling, visual imagination, computation and data analysis. Mathematical abstraction refers to the quality of mathematical research objects through the abstraction of quantitative relationship and space formation. Logical reasoning refers to the quality of putting forward other propositions according to rules from some facts and propositions. Mathematical modeling is the accomplishment of mathematical abstraction of real problems, expression of problems with mathematical language and construction of models to solve problems with mathematical methods. Visual imagination refers to the quality of perceiving the shape and change of things with the help of geometric intuition and spatial imagination, and using spatial forms, especially graphics, to understand and solve mathematical problems. Computation refers to the accomplishment of solving mathematical problems according to the algorithm on the basis of defining the operation object. Data analysis refers to the acquisition of data by research objects, the use of mathematical methods to organize, analyze and infer data, and the formation of knowledge literacy about research objects [1].

The core qualities of mathematics are all integrated and complementary. Mathematical abstraction is an important method to extract mathematical relations and the main means to form other core literacy. Through the visual imagination of things, and then the use of mathematical abstraction can establish a mathematical model. Data analysis and mathematics core literacy not

only reflect the pace of the new curriculum reform, but also show that it has entered the era of big data. Ubiquitous data, data analysis capabilities are also urgently needed. Data analysis extracts the relationship between data through mathematical abstraction, and then establishes data model. Mathematical operation is the foundation of mathematics and the foundation of other core literacy. Modern mathematical model is mainly solved by computer, and the execution program of computer mainly relies on mathematical operation to realize algorithm. The intermediate processes are all connected by logical reasoning. The main relations of mathematics core literacy are as follows:

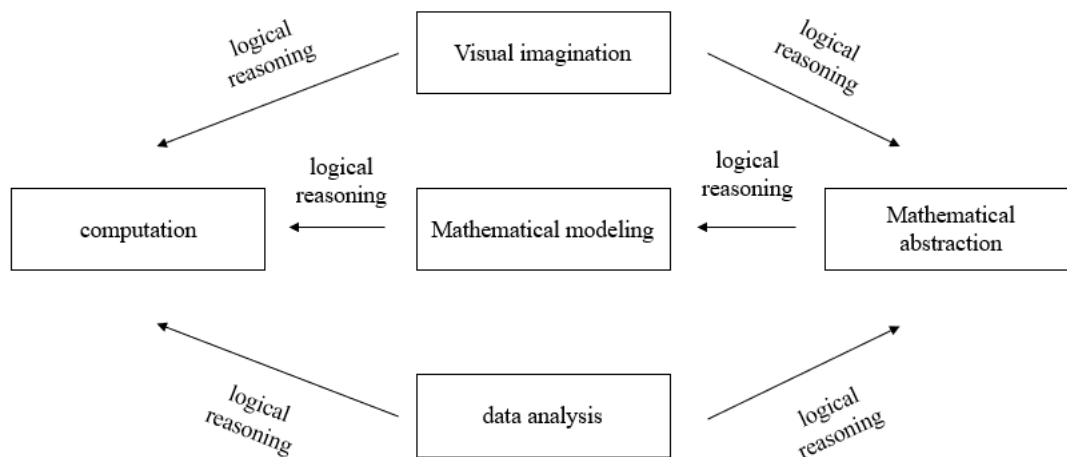


Figure 1 Math Core Literacy Relationship Diagram.

3. Middle School Mathematics Teaching Under the Guidance of Core Accomplishment

3.1 Strengthen Students' Main Position and be good at Guiding Discovery

The requirement of the new curriculum reform is that teachers should make a good transformation of their roles, and teachers should change from knowledge givers to students' learning guides. The main task of teachers is no longer to impart knowledge, and students are no longer passively receiving knowledge. Interest is the best teacher for students to learn. Teachers should take it as their main task to stimulate students' learning motivation, guide students' learning methods, organize, manage and guide students' learning process, and cultivate students' ability of autonomous learning and cooperative learning. Mathematics as a science subject, if we simply impart knowledge, students will be difficult to understand and flexibly use. In mathematics teaching, teachers should strengthen the main position of students and the leading position of teachers. The teacher changes from the classroom speaker to the classroom server and return the class to the students. Teachers should focus on the design of teaching activities, stand in the perspective of students, find out the difficulties of students and guide them. The first step of teaching design is to carefully analyze the teaching materials and learning situation. This is a necessary job for a qualified mathematics teacher before class. Only by understanding the teaching materials and students can we know how to teach well and how to guide students. To guide students, we should use correct guidance methods, master the principle of step-by-step, lay a good foundation within the scope of students' ability, and gradually guide the key and difficult points of the final and then guided learning. For example, at the beginning of a math class, the teacher should lead the students into the math class step by step. There are many methods of classroom introduction. Teachers should choose appropriate methods according to the content of this class.

3.2 Get Used to Summarizing Learning Methods and Leading Success

Any study is inseparable from practice and practice, and the cultivation of core literacy is no

exception. For example, the mathematical operation in the core literacy, the mathematical operation from the first grade of primary school to learn the addition and subtraction method, the second grade to learn the multiplication table, etc., which need a lot of practice to be familiar with the operation rules and flexible use. But can we cultivate the mathematical literacy of mathematical operation only through a lot of practice? The answer is No. At present, many middle school students have some misunderstandings about mathematics. They think that as long as they do more exercises, they will learn this knowledge? There is no denying that it is possible to achieve the goal through a lot of exercises. However, there is a shortcut to learning, which is "learning to summarize". In the process of learning mathematics, we should not only learn to summarize the concepts and knowledge points in the textbook, but also summarize the mistakes in practice. Failure is the mother of success. Success is also the mother of success. Students should sum up the success or failure experience of others or themselves, and use the same method to achieve success or avoid making the same mistakes in the next encounter of the same mathematical problems. For example, in the daily teaching of mathematics teachers, students should be required to prepare a wrong book, which can record the students' mistakes. Mathematics teachers should regularly browse students' wrong book, fully understand students' current learning status, and timely guide and correct students' errors.

3.3 Pay Attention to Individual Differences of Students and Carry out Teaching Reasonably

There are not two identical people in the world, so are the students. The student view of "people-oriented" holds that students are unique people, and there are differences in their physical and mental development and ability. Teachers should face up to students' individual differences from their own development, overcome the shortcomings of measuring students according to unified standards and scales, and pursue complete convergence and uniformity. Teachers should teach students according to their aptitude. Teachers are required to implement the principle of individual treatment in the process of education, adapt to the circumstances, and vary from person to person, create learning environment and conditions suitable for students, and different people get different development in mathematics. After the students enter the middle school, the middle school mathematics content gradually becomes abstract, more difficult to understand, and individual differences are very obvious. In teaching, teachers should be stratified teaching, should not ignore any individual, teaching for all students. For example, when teachers assign homework after class, they should choose the right exercises according to students' ability, and provide the students with strong ability to choose and do the exercises. In this way, students with weak ability can not only keep up with the rhythm of teachers, but also students with strong ability can get full practice and improve themselves.

3.4 Mathematics Teaching Close to Life and Discover the Beauty of Mathematics

Middle school mathematics is closely related to our life. Teachers should make the knowledge in the teaching materials live, so that students can reduce the strangeness of mathematics, which is conducive to improving students' interest in mathematics. This kind of teaching method not only exerts students' learning ability, but also has great significance for the cultivation of core literacy. Solving practical problems in life is an important performance of improving core literacy. Creating familiar teaching situations can make students more interested in learning, thus enhancing their logical thinking ability and core literacy.[2] For example, the first abstract concept "function" in the middle school mathematics textbook. In teaching this class, teachers should prepare enough life examples to help students understand the concept of function. First of all, curriculum introduction, teachers should grasp the nature of the function is the mapping relationship. Teachers can find the most common mapping relationship in life as ID card number, each person has a unique ID card number, and the person and ID card number are one-to-one correspondence. To further guide a person, there are many names, but only one ID card number. In this case, it can be concluded that any X of the definition of a function has a uniquely determined corresponding to it. By listing examples in life, not only can students learn the concept of function, but also strengthen their understanding and memory. Common examples in daily life can help students to review concepts

repeatedly.

3.5 Carry Out Mathematics Teaching Experiment and Enhance Learning Interest

As a basic science, middle school mathematics can also be experimented like physics and chemistry. At present, there are few middle schools that set up mathematics experiments in middle schools, which is the weak place of mathematics education in middle schools. For students, the middle school mathematics experiment can not only improve the interest of mathematics, but also make mathematics knowledge applied. For teachers, they can pass on the boring mathematical theory to students through mathematical experiments. According to the nature of mathematics experiment, the mathematics experiment can be divided into the following types: exploratory mathematics experiment, which allows students to carry out experiments after analyzing problems, and then summarize the general laws through observation, and use the laws for verification. Modern mathematics experiment mainly uses computer and other modern experimental teaching aids to simulate a certain experimental environment, combined with mathematical modeling to analyze and explore the experiment. Confirmatory mathematical experiment is a process of verifying known mathematical theorems or laws through traditional or modern mathematical tools. The experiment of mathematical thought is aimed at the specific mathematical problems, through the creation of a certain mathematical situation, through ideological activities. To study some mathematical phenomena and explore the process of mathematical laws [3]. For example, modern mathematics experiments can teach students the use of geometric sketchpad. Through the use of geometric sketchpad, students can not only cultivate the ability of visual imagination, the ability of observing graphics and the ability of spatial imagination of three-dimensional graphics, but also stimulate their curiosity and interest.

4. Conclusion

The core quality of middle school is the basic guidance of middle school mathematics teaching, and the main way to implement the basic task of cultivating people by virtue. The relationship between core literacy is mixed and cannot play an independent role. Teachers should correctly understand their main position and face up to students' differences, and play a correct role in guiding students. In terms of teaching methods, teaching should be life-oriented, and actively carry out mathematical experiments and practices, which is conducive to improving interest in learning.

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