

Based on Problem Situation Creation, Students Cultivate Students' Core Mathematical Literacy

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Abstract: *What mathematical literacy refers to, the first thing to understand is that mathematics requires very rigorous subjects, definitions, practical operations, logical proofs, and so on. Many aspects require you to have a careful thinking and a rigorous attitude. Learn mathematics to learn to learn to repeat three, the "anti-three" here is not as simple as changing the number of the same problem during the student period, but to link the knowledge learned before, after solid foundation, to try to use new knowledge to solve other problems, to understand the scope of application of this knowledge, what reproduction and change. Formulas, theorems, have to be deduced several times by themselves, understand, and then experiment with extreme conditions to see what conditions it is tried. This is much slower than memorizing by rote, but it will be more like a fish in the water and easy to use later.*

Keywords: High School Mathematics; Core Literacy; Problem Situations; Creation.

1. CREATING A 'LIFE ORIENTED' PROBLEM SCENARIO

In high school mathematics classroom teaching, fundamental things or already understood knowledge must be repeatedly practiced or even memorized. Understanding is essential, but proficiency in knowledge is also important. This level of proficiency can only be accumulated through continuous repetition and use. For example, a bunch of formulas for trigonometric functions can indeed be deduced by oneself when needed, but it is a waste of time. It is better to immediately practice and proficiently use them after understanding, and then come up with suitable formulas when needed, which is much faster. Be diligent and write it yourself once or even several times. After putting one's thoughts into writing, it is easier to expose areas of lack of rigor in one's thinking. I think if I know a problem by myself, at most I will know the starting point and problem-solving steps, but the actual calculation still depends on the effort put into writing. Just like the answers on a draft paper are not counted towards the grade, the final answer to be presented should be formal, concise, and elegant problem-solving steps and answers. Firstly, memorize all formulas and theorems. Any complex problem is a combination of these basic formulas, like building blocks with uneven triangles. How to spell out what you want. Secondly, memorize the derivation process of these formulas and theorems. Complex formulas are derived from simple formulas, which contain problem-solving ideas and application methods. Understanding is more important than memory. After listening to the deduction process and problem-solving process, try to summarize the deduction process in a few sentences. What you understand is your own. Formulas that you can't remember during exams can be deduced on paper. After understanding, you will find that there are commonalities between these formulas and the deduction process. Remembering the most fundamental thing is enough. At this time, you will realize that the entire high school mathematics, whether it is formula theorems or problem-solving ideas, is pieced together with a few building blocks. Put in hard work and spend time memorizing by rote. When facing anything, find patterns and shortcuts to make complex things simpler, and use them in thinking. In the process of teaching this subject, high school mathematics teachers should first have a comprehensive understanding of their own actual situation, continuously accumulate more teaching experience, and proficiently master the relevant theoretical content. The key is to analyze and explore the development situation in the teaching field, and formulate teaching models and strategies that are in line with the characteristics of the current era. High school mathematics teachers should efficiently apply the mathematics teaching model to effectively improve their teaching efficiency. During this period, they should also focus on the important content and optimize their professional skills and comprehensive literacy. In the process of improving and innovating the teaching mode of mathematics, high school mathematics teachers need to innovate their teaching concepts and participate as much as possible in some professional training activities organized by the school. This can better grasp some knowledge and skills related to mathematics teaching. Teachers should also communicate and exchange more with teachers who have strong teaching abilities and innovative teaching modes, learn from each other's strengths and weaknesses, improve their own shortcomings in mathematics teaching, and flexibly apply their teaching professional knowledge to practical situations according to relevant teaching requirements. In addition, teachers need to have a comprehensive understanding of students' actual situation and learning ability in mathematics, understand their overall goals and

directions for mathematics teaching, constantly reflect on the problems they encounter in the education process, and improve themselves, in order to achieve innovation and quality optimization of mathematics classroom teaching models.

2. CREATING 'FUN' PROBLEM SCENARIOS

Interest is the driving force of education, and once mathematics is understood, it becomes very simple and clear. Therefore, when studying mathematics books, one usually only reads theorems, strives to understand theorems, and then independently thinks about mathematical proofs. However, in most cases, it is difficult to come up with a solution, and in the end, one can only refer to the proof in the book. However, sometimes the process of repeatedly reading the proof is difficult to understand, in which case I try to copy these mathematical proofs in my notebook. In the process of copying, turn to seeking whether there is a better proof method. If it can be found smoothly, it's okay. If it's difficult to find for a while, one will often fall into deep contemplation and only give up when there's no way out and the lamp runs out of fuel. According to this method, by the end of a chapter, it has been more than a month, and the content at the beginning has long been forgotten. I had no choice but to turn back and start over from scratch. From slow to fast: $1+1$ is always understood, so where did it get stuck/why did it get stuck? You can consult others, refer to other books, and search for answers online. Once understood, it becomes very simple and clear. Think more and summarize the problems that have already been understood, think more about why this solution is used in books, whether it can be solved by oneself, whether there is a reasonable method, and whether this problem is related to other problems. Develop one's own approach to solving mathematical problems and know the starting point; Cultivate a taste in mathematics. One advantage of mathematics is that each step can be rigorously deduced. At the beginning, it can be deduced step by step, and as the level increases, it can become faster and faster. Apart from the possibility of spending more time at the beginning, there is no math that cannot be learned. There are examples of predecessors copying books, and there is no difficulty that cannot be overcome. Pre class preparation is very important. Even if you don't understand, mark the parts you don't understand and continue reading. Then, listen carefully in class to strengthen your understanding. You can take notes in class, but you need to listen to the lecture again. Just jot down some key points in your notes. For example, there may be some technical changes in typical problems that you can memorize. Other calculation processes are unnecessary and time-consuming, which can affect the quality of the lesson. Do more exercises and organize error books. When doing exercises, you can consider the combination of tree structures, which will make understanding much easier. Wrong question books are very important. When I was in high school, I memorized about three books. After summarizing the wrong questions, you will find that you have a good understanding of the question types of a knowledge point, and then you can summarize what types of questions will appear. When needed, you can also leave a few pages only to write the title, and take it out to review how to do it and what your ideas are; Remember the formulas related to mathematics, but don't just memorize them. Because I also have a headache memorizing things, but by doing more exercises and using this formula more often, it will be much easier for you to remember. If necessary, you can learn about the derivation method of simple formulas. Remember not to be afraid of difficulties. You can learn about the sources of some mathematical knowledge or the applications of mathematics in daily life outside of class (books or videos are both available), and enhance your interest. After all, interest is the best teacher.

3. CREATE A 'HISTORIC' PROBLEM SCENARIO

Under the influence of core competencies, mathematics hierarchical teaching in high school requires teachers to pay attention to personalized cultivation of students, use various teaching methods, and cultivate students' professional level, which can further promote their healthy development. So teachers need to adapt to today's new educational requirements, actively collect various information from students, increase communication and interaction with students, scientifically and reasonably provide hierarchical guidance, and respect students' differences in learning. Enriching the content related to teaching and planning teaching objectives are more conducive to students at all levels mastering mathematics, improving their learning efficiency, and achieving efficient teaching. For example, teachers can classify students into various levels such as top students and average students based on their actual learning situation, personal hobbies, and basic mathematical knowledge, and carry out educational guidance work accordingly. Poor mathematics is nothing more than a lack of mastery in basic mathematical knowledge and mathematical thinking. If the methods and foundations (definitions, theorems) of learning mathematics are not solid, one will not be able to learn at all, especially if they do not carefully appreciate and appreciate these scientific concepts. So I worked very hard, diligently practicing the questions, but still had only a partial understanding of these concepts. Even some classmates questioned, saying, 'I can do problems

without mastering the concepts.'. However, if mathematical thinking is like a skill required to become a Michelin 3-star chef, then the basic knowledge is to prepare dishes. A clever woman cannot cook without rice. If the rice is not washed well, the meat is not cut well, and the pot is not washed clean, no matter how skilled her skills are, she cannot cook a dish well. Basic concepts should be carefully read. In fact, mathematics, science (physics, chemistry, etc.), and poetry are very similar, both attempting to express them in the most concise language: mathematics/science depicts the external environment we are in - the myriad phenomena of nature, while poetry depicts the complex emotions within us. During the design phase of teaching content, the main goal is to cultivate core competencies. By introducing appropriate teaching materials from extracurricular activities and enriching the relevant teaching content, we can provide students with the cultivation of core competencies and make their artistic theoretical knowledge more solid. Secondly, it is necessary to design the teaching process, during which attention should be paid to optimizing the classroom teaching process, starting from core competencies, improving students' practical exercises in the classroom, scientifically and reasonably allocating teachers' explanations and students' self-study time, effectively stimulating students' individual learning motivation, and ensuring that students can effectively participate.

Therefore, such a thing is redundant. Be sure to read carefully, understand word by word, don't read extensively like a novel. What is an ellipse? Don't rush to read the following text, think about what is a hyperbola. Many people's answer is: 'The difference in distance to two fixed points is equal to the set of fixed length points,' but unfortunately this is incorrect. The correct answer is: "The absolute value of the difference in distance between two fixed points is equal to the set of points of fixed length (the length of the line segment between the two fixed points is greater than this absolute value >0).". Without the words "absolute value," what is obtained is a branch of a hyperbola. Learn to read carefully and understand these definitions and concepts. The definition in high school textbooks is as follows: the force that impedes the relative motion (or tendency of relative motion) of an object is called frictional force. In high school, it is proven that there can be at least 5 different theorems for the perpendicularity of lines and surfaces. All those who say they can improve their grades without reviewing their basics are scammers. Some irresponsible people, in order to make money, create a bunch of "templates" and "flash sales", and claim that "they can solve problems without reviewing the basics". It sounds particularly impressive, but it actually causes a lot of harm. Firstly, logically speaking, no matter how clever the way of thinking is, is it possible to deduce various definitions and theorems established by mathematicians over hundreds of years within two hours? Furthermore, this type of template is called "curve fitting" in finance. The template is only suitable for a small category of questions carefully selected by him, and if the questions are changed, he will be killed. In today's increasingly flexible college entrance examination questions, relying on these garbage, how can exams be improved, and the future will be a lifelong mistake! The biggest characteristic of exams, whether you like it or not, is the time limit. Therefore, a person who can score high must be able to solve simple problems quickly and correctly, so as to have time to think about difficult problems. Therefore, regular practice should be timed. For example, when choosing fill in the blank questions, try not to exceed 5 minutes. If it exceeds, consider it a wrong question. This practice can also familiarize oneself with the pressure and tension of exams. It's not easy to perform poorly during actual exams. There are three types of problems that can be learned from mistakes: carelessness, unclear concepts, and logical problems. These three must be strictly distinguished. Questions that cannot be done, questions that are done slowly, and questions that are not completed within the designated time are all mistakes. Many students encounter wrong questions, so they scan the answers once and understand them. This kind of learning is a waste of questions and time! Over time, this seems like a lot of effort, but it's just a repetition of useless work. Method errors are the fundamental reason why a person cannot learn.

Under the influence of cultivating core competencies, teachers need to use evaluation and assessment to understand the actual development of students' core competencies, and discover the problems that students encounter in their core competencies. This is more conducive to guiding students accordingly, helping them learn from each other's strengths and weaknesses, and improving their overall core competencies. In the actual teaching process, teachers can conduct comprehensive teaching activities, combining theoretical knowledge with practical operation ability, from which students' core competencies can be assessed. For example, after teaching about area related knowledge, teachers can organize students to measure the area of objects such as desks and windows, use relevant knowledge to complete calculations, and evaluate students' abilities in various aspects such as calculation. There are many boring formulas and calculation processes in textbooks, which are difficult for students to understand and remember. Teachers can use relatively simple and easy to understand methods to teach students the knowledge content in textbooks. There are many ways to teach knowledge, but this cannot be separated from textbooks. It is necessary to combine life with teaching textbooks. During actual teaching, mathematics teachers need to be above and below the textbook, which refers to having their own understanding based on the textbook,

and these understandings can be combined with the knowledge in the text. High school teachers need to understand the current understanding and logical thinking characteristics of students, and combine their active and flexible thinking methods to effectively adjust and improve their teaching methods. During the teaching process, teachers can use commonly encountered cases or animations in daily life to increase high school students' interest in learning mathematics and cultivate their comprehensive mathematical literacy. Combining numbers and shapes is also an important mathematical thinking for mathematics teachers during the teaching process. Combining numbers and shapes refers to using relatively simple graphics to simplify complex mathematical problems, concretize them into mathematical shapes, effectively abstract them into concrete, and simplify more complex problems. This can increase students' interest in learning mathematics. At the same time, this kind of thinking can also be used to help students break away from the inertia thinking that numbers are just numbers and graphs are graphs, and combine numbers with graphs. Effectively cultivating students' ability to combine numbers and shapes, enabling them to apply mathematical thinking in a good way. Therefore, if students can make shapes themselves when learning to calculate the area of shapes, and complete the course with both shapes, it can greatly deepen their understanding and cognition of the relationship between shapes and numbers, and further improve their thinking ability.

4. CONCLUSION

In summary, the consciousness of thinking should adhere to the principles of rationality and effectiveness, and master the skills of transforming mathematical core literacy into specialized thinking. In this way, each question has gains for students, and then students will test their gains in the next question. Soon, their level will rise sharply and they will continue to innovate and make progress. The ideological and political construction of the curriculum requires not only the continuous efforts and practice of the teachers, but also the effective promotion of the top-level design. Higher vocational colleges generally have both the characteristics of students and local advantages in the specialty setting, and also have regional ideological and political education resources. Schools often rely on the ideological and political education resources with regional characteristics, build a complete curriculum ideological and political education system, carry out top-level framework design, coordinate all kinds of resources, and give full play to their school-running advantages from the perspective of talent cultivation. To create a relaxed teaching and research environment and form a virtuous circle, it is necessary to pay attention to the work and life status of curriculum management teachers in a timely manner. First, schools should optimize the construction of innovative ideological and political teachers through the combination of "internal training" and "external guidance"; Second, increase the proportion of innovative political teachers in school teacher training; The third is to arrange teachers to take exercises in relevant practice bases or teacher training base enterprises in a targeted manner, and improve teachers' innovative practical ability by means of customized plans, organizing teachers to participate in various innovative professional qualification certification training classes in batches and levels. The fourth is to purposefully integrate and cultivate the theoretical teaching and practical teaching ability of "post class competition certification and innovation", improve the practical ability of teachers in building industrialization and the ability to control the construction market information, and promote the level of teachers' teaching reform and scientific research.

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