

The Strategies of Cultivating Mathematical Thinking Ability in Primary School Mathematics Teaching

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Abstract: *The ability of mathematical thinking refers to that students use their own mathematical thinking and logical ability to solve mathematical problems, fully develop reasonable imagination, and then summarize and summarize the methods to solve specific mathematical problems based on their own mathematical knowledge. Therefore, it is necessary to strengthen the cultivation of primary school students' mathematical thinking ability. And mathematics is a subject with strong logic thinking. However, due to the young age of primary school students, their thinking ability is limited, their life experience and experience are insufficient, and their knowledge reserve is relatively weak, which makes the primary school students' mathematical thinking ability still has a large room for improvement. Therefore, cultivating students' mathematical thinking ability in primary school mathematics teaching can not only improve learning efficiency, enable students to fully understand and firmly grasp the mathematical knowledge they have learned, and apply mathematical knowledge to solving practical mathematical problems, but also promote teachers to effectively promote and implement teaching programs. Based on this, this paper expounds the important influence of the cultivation of mathematical thinking ability on primary school mathematics teaching and the basic requirements for the cultivation of mathematical thinking ability in primary school mathematics teaching, and discusses and analyzes the strategies for the cultivation of mathematical thinking ability in primary school mathematics teaching.*

Keywords: Training of mathematical thinking ability; Mathematics teaching in primary school; influence; requirement; strategy.

1. THE IMPORTANT INFLUENCE OF THE CULTIVATION OF MATHEMATICAL THINKING ABILITY ON PRIMARY SCHOOL MATHEMATICS TEACHING

The content of primary school mathematics knowledge is relatively simple, and primary school mathematics is also the foundation stage. If the correct method is not mastered at this time, it will have a serious impact in the future application practice, which is not conducive to improving students' mathematics performance. In the traditional teaching concept, teachers interfere too much with students' way of thinking, which leads to the restriction of students' thinking of solving problems, and the methods used by class members are also the same. In the face of such problems, strengthening the cultivation of mathematical thinking ability can help students form a good habit of autonomous learning, and can not be interfered by external factors in the process of solving problems, and deepen the understanding of mathematical knowledge points, which is naturally not available in traditional teaching methods. The mathematical thinking ability is not only reflected in the problem solving stage, but also includes the form of students' view of problems. Although the content of knowledge learned during primary school is relatively simple, However, with the deepening of the teaching plan, this kind of thinking will also play a more profound role in helping students to connect the contents learned at each stage, and flexibly run the knowledge points to solve problems, so as to achieve the ultimate ideal learning effect of mathematical knowledge. After improving the ability of mathematical thinking, teachers will explain new problems more smoothly. Students can actively cooperate with teachers, put forward their own views on the problems, apply the content of knowledge learned in real life, and realize that mathematics learning really enters the stage of life. Students can also feel the joy of learning.

Singing-Game is reappeared in the new era Compulsory Education Art Curriculum Standards (2022 Edition), which is the sixth time in all education regulations. This shows that Singing-Game teaching is scientific and feasible to a certain extent, and it echoes the educational philosophy of the new era. Analyzing six curriculum standards containing Singing-Game content over the years, and using the historical drafts of education policy, will help us objectively analyze the trend of music education policy, changes in music teaching goals, and the merits of Singing-Game teaching.

2. BASIC REQUIREMENTS FOR TRAINING MATHEMATICAL THINKING ABILITY IN PRIMARY SCHOOL MATHEMATICS TEACHING

The cultivation of mathematical thinking ability in primary school mathematics teaching requires that the teaching objectives should be set scientifically in combination with the specific life practice, and the elements in the classroom should be carried out around the cultivation objectives of mathematical thinking, while combining with the classroom teaching practice. Therefore, the author believes that the cultivation of mathematical thinking ability in primary school mathematics teaching should follow the following basic requirements. Singing-Game appeared for the first time in 1936, and with the continuous iteration of modern school music education, it has successively appeared in the six curriculum standards of our country (See Table 1 for details).

Table 1

Time	Name of Course Standard	Category	Main Points
Before the founding of the PRC	1936 <i>Singing-Game Curriculum Standards for Lower Primary School</i>	singing, rhythm, dancing, games	Imitation of natural sounds, various rhythmic activities (such as running, flying birds, ducks, etc.), simple folk dances, various games, etc.
	1948 <i>Singing-Game Curriculum Standards for Lower Primary School</i>	appreciate, practice	Appreciation, listening, pronunciation, performing songs, rhythm activities, children's band, games, etc.
Time	Name of Course Standard	Content	Requirement
After the founding of the PRC	1988 <i>Nine-year Compulsory Education Full-time Primary School Music Syllabus (first review draft)</i>	Singing-Game	1. The content of Sing Game teaching includes rhythm, music games, singing performance and group dance, etc. 2. Cultivate students' sense of rhythm and rhythm through Singing-Game teaching, so that students can sing, play and dance emotionally based on feeling and understanding music.
	1992 <i>Nine-year Compulsory Education Full-time Elementary School Music Syllabus (Trial)</i>	Singing-Game	1. Ditto 1 2. Cultivate students' sense of rhythm and rhythm and carry out activities such as Singing-Game emotionally based on feeling music.
	2000 <i>Nine-year Compulsory Education Full-time Primary School Music Syllabus (Trial Revised Version)</i>	Singing-Game	1. Ditto 1 2. Pay attention to creativity and interest and cultivate students' sense of rhythm and rhythm based on feeling music.

2.1 According to the requirements of the new curriculum standard

Primary school teachers should formulate the Training Plan for Improving the Mathematical Thinking Ability of Primary School Students according to the basic requirements and principles of the new curriculum standard. Therefore, before formulating the training plan, teachers should thoroughly understand and master the basic requirements and principles of the new curriculum standard. So that the training program formulated conforms to the actual situation of teaching. Teachers should implement the teaching requirements of teaching students according to their aptitude, and after thoroughly understanding the actual situation of all students, Develop an objective and comprehensive training plan so that all students in the class can better understand and master mathematical knowledge.

2.2 Requirements for gradual progress

When training the mathematical thinking ability of primary school students in teaching, teachers should know that this will be a long-term process. They should not have a quick sense of accomplishment, but should follow the principle of gradual progress. To cultivate the mathematical thinking ability of primary school students, it should go through a long learning period for continuous accumulation and a process from quantitative change to qualitative change. Because mathematical thinking ability exists in the whole knowledge system of mathematics, students must learn different mathematical classification knowledge, and apply the principle of gradual promotion to promote and improve students' mathematical thinking ability.

2.3 Singing-Game Curriculum Standards for Lower Primary School under the Three Principles of the People in 1936

The Principles for the Implementation of the Three People's Principles of Education promulgated in 1931 stipulates that "music, songs, pictures, etc., should be used to mold children's sentiments and make them more exposed to nature in order to develop aesthetic tastes." [3] This principle of educational implementation laid the

groundwork for the birth of the Singing-Game educational regulations. In 1936, the Singing-Game Curriculum Standard for the Lower Grades of Primary School was promulgated, and Singing-Game first appeared in education regulations. This is not only a change in the superficial name, but also a fundamental change in the concept and purpose of music teaching. Change the previous music courses named after singing and music lessons. This set of Singing-Game music curriculum standards breaks the original model of imitating professional music education and learns and appreciates music based on students' interests.

This Singing-Game curriculum includes two subjects of music and physical education, and it is only implemented in the lower grades of primary school (grade 1-2). Many games in the curriculum standard are selected from the Details of Physical Education Professors in Primary Schools and Graded Physical Education Textbook. The music elements of singing, rhythm, and dance are integrated with sports games, so that students can feel music in the game and exercise, and strengthen their bodies through music perception, which embodies the interdisciplinary concept of music and sports.

2.4 Singing-Game Curriculum Standards for Lower Primary School under New Democratic Education in 1948

The background of the formulation and promulgation of the second Singing-Game standard took place in my country's third curriculum reform, which was in the period of my country's liberation war. This curriculum standard implements the national, scientific, and popular new-democratic education policy, the principle of combining education with productive labor, and combining theory with practice [4]. Music teaching requires that the Singing-Game subject in the lower grades of the primary school should be in close contact with other subjects in addition to the mixed singing game. This kind of Singing-Game textbook should contain the democratic significance of collective labor and fighting against Japanese invasion of China[5].

Compared with the previous one, the formulation of the 1948 edition is more succinct, only divided into two objectives and an outline. The new democratic education policy has been injected into the educational thought. Ideological politics and music education go hand in hand, so that the junior students who are not familiar with the world can subtly experience the national spirit of patriotism and unity in the study of Singing-Game.

The two Singing-Game regulations before the founding of the People's Republic of China originated from the Three People's Principles and started from the New Democracy. The main educational concepts are to adapt to the physical and mental development of children. The educational ideas, educational objectives, teaching content, and class schedules reflected have begun to be standardized, reflecting the interdisciplinary comprehensive education concept of music, physical education, and political education has opened the scientific road to the formulation of Singing-Game curriculum standards.

3. ANALYSIS ON THE STRATEGIES OF CULTIVATING MATHEMATICAL THINKING ABILITY IN PRIMARY SCHOOL MATHEMATICS TEACHING

3.1 Reasonable use of combination of numbers and shapes

The rational application of the teaching method of combining numbers and shapes can not only help students better understand abstract mathematical knowledge, but also enable students to study and study the essence of knowledge by combining quantitative relations and spatial forms, effectively expand students' thinking, and further deepen students' memory of mathematical knowledge. In teaching design, teachers can use some intuitive graphics to convert them into quantitative methods, and then solve practical mathematical problems. For example, when learning to calculate the circumference of a square, teachers should not let students memorize mathematical formulas mechanically according to the traditional teaching methods, but can use the teaching method of combining numbers and shapes to make students solve this problem according to the mathematical thinking they have mastered.

3.2 Strengthen language training

Language is the form of thinking, so paying attention to the training of students' language is conducive to the

cultivation of primary school students' mathematical thinking ability. For example, when talking about odd and even numbers, because students are particularly easy to confuse these two concepts, teachers can teach students simple methods. When 0 and even numbers are mantissas, they are even numbers, and the rest are odd numbers. In addition, teachers can also link mathematics with students' life reality to train students to use the mathematical knowledge they have learned to solve problems in life, so that students can improve their thinking ability while solving practical problems. For example, the teacher can set questions that are closely related to life, and the chicken farm will put the chicken into the market, First one fifth of the chickens were cast, and then 321 were cast. How many chickens are there in this batch? In this way, teachers can translate the complex problems in books into reality, and can solve problems visually, so that students can cultivate mathematical thinking ability by solving problems. In addition, the teacher should not only arrange the exercise questions that should be used to consolidate the training for the students, but also combine the knowledge learned before when setting the exercise questions, so that students can fully understand and understand the new and old knowledge, which is more conducive to the study of mathematics. In addition, when reviewing the lesson, the teacher should also guide students to learn how to summarize the basic properties so as to clarify their ideas, so that students can effectively contact the knowledge points themselves, so that students can form systematic mathematical thinking.

3.3 Strengthen the connection between new and old knowledge

The cultivation of primary school students' mathematical thinking ability in mathematics teaching in primary school is reflected in the whole process of mathematics teaching. Therefore, it is necessary to achieve this by connecting and developing new and old knowledge. In the process of teaching students new knowledge, teachers should maximize the connection between the old knowledge and the current new knowledge for teaching, so that students can understand the organic connection between the new and old knowledge, and learn to apply divergent thinking to expand mathematical thinking mode. For example, when teaching "Subtraction within 100", teachers can organically link the addition content they have learned before, so that students can better understand the subtraction thinking while reviewing the addition thinking.

3.4 Make full use of reverse thinking

In primary school mathematics teaching, because mathematics knowledge itself has close internal relations, when learning mathematics, teachers need to teach students how to effectively use positive thinking to think and solve mathematical knowledge, and also need to use reverse thinking to cut in. When training students' reverse thinking ability, teachers can create vivid and interesting teaching situations to carry out special thinking training for students. For example, we can create an interesting case that bears share corn for teaching. The two bears have a pile of corn sticks in the ft, and the two bears are straightforward and lovely. After the first bear divided the shared food corncob into two parts, he took one of them as his private food. He didn't tell his partner about this. Another little bear returned to the ft and didn't know how it happened. After distributing the remaining corncobs equally, he saw that there was one more corncob, so he threw the corncob down the ft cliff and took his own corncob. Assuming that the number of corn sticks in this pile is more than 100, the first one How many corn sticks did the bear get? If we adopt positive thinking to think, it will make students feel difficult to solve the problem, and make students unable to break through the problem. We should better solve the problem. Teachers can further guide students to transform the original positive thinking mode into reverse thinking mode to think, and use X represents the number of corn sticks obtained by the second bear, so the number of apples before the second bear obtained corn sticks should be $2X+1$. The teacher asked why there was $2X+1$? The teacher can make inferences after the students answer. The whole pile of corn sticks should be $(2X+1)+(2X+1)+1$, that is, $4X+3$. It is estimated that the total number of corn sticks should not be less than 100, so the X should be greater than 25, that is, the number of corn sticks that the first bear can obtain should not be less than 51.

3.5 Use of multimedia teaching methods

Reasonable use of multimedia teaching means to assist teaching is an important way to improve the teaching efficiency of primary school mathematics. Multimedia teaching can express the abstract concepts in mathematics vividly and concretely so that pupils can intuitively feel it. Its form is relatively fresh and easy for students to accept. It can not only arouse students' interest in learning primary school mathematics, but also help deepen the deep impression of knowledge points in pupils' minds, and has an important role in promoting the cultivation of pupils' mathematical thinking. This teaching method breaks the limitations of traditional teaching and displays knowledge dynamically and intuitively, which is more conducive to students' understanding and mastering of theorems and concepts.

4. CONCLUSION

To sum up, the primary school stage is the key period for laying mathematical knowledge, and improving the mathematical thinking ability of primary school students will have a positive impact on the future growth of students. Moreover, as an important support for integrating theory with practice, the ability of mathematical thinking in primary school is the key to fully display the charm and connotation of mathematical thinking in primary school. Teachers must select appropriate teaching content according to the teaching objectives, and use relevant strategies to cultivate students' mathematical thinking ability on the basis of the existing teaching structure, so as to improve pupils' mathematical performance.

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