

Research on the Design and Implementation of Students' Homework Based on Primary School Mathematics Core Literacy

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Abstract: With the continuous renewal of educational concepts and the deepening of educational reform, the cultivation of students' core literacy has gradually become the focus of primary school mathematics education. This paper focuses on the design and implementation strategies of primary school mathematics homework based on the development of students' core literacy, and reveals the shortcomings of traditional homework design by analyzing the current situation and problems of primary school mathematics homework design. The strategies of homework design based on the development of students' core literacy are put forward, including the integration of core literacy concepts and objectives, the design of inquiry questions and tasks, the emphasis on cooperation and communication, personalized homework design, and the provision of timely feedback and evaluation. Combined with the case analysis, the effectiveness of the strategy is verified, in order to provide useful guidance and enlightenment for the improvement of the quality of primary school mathematics education in China.

Keywords: Primary School Teaching; Mathematics Teaching; Core Literacy; Homework Design

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Introduction

In recent years, with the deepening of China's education reform, the traditional primary school mathematics education can no longer meet the needs of students' all-round development. Students need to have core qualities such as creative thinking, problem solving ability, communication ability and critical thinking to meet the needs^[1]of future society and occupation. As an important part of primary school mathematics teaching, homework plays a vital role in students' learning process. However, the current primary school mathematics homework design mainly focuses on traditional exercises and applications, pays more attention to the mechanical application of the calculation process, and neglects the cultivation^[2]of students'ability to think deeply and solve problems creatively. This mode of homework design often leads to students'boredom in learning mathematics and loss of interest and motivation in learning mathematics. In addition, the repetition and lack of individualization of homework also make students lack autonomy and initiative, and can not give full play to their potential.

Therefore, in order to improve the quality and effect of primary school mathematics education, it is necessary to explore the homework design strategies that can improve students' core literacy from the perspective of homework design. Primary school mathematics homework design strategies based on the development of students' core literacy can stimulate students' interest in learning, cultivate students' creative thinking, problem-solving ability and communication skills, so that they can achieve better results in mathematics learning, thereby improving the quality of primary school mathematics teaching.

This paper aims to study the design and implementation of students' homework based on the core literacy of primary school mathematics, in order to improve the quality and effectiveness of primary school mathematics education, through the analysis of the current situation and problems, the proposal of strategies and the verification of cases, in order to provide useful inspiration and guidance for primary school mathematics

teachers and educational researchers, and then promote the cultivation and development of students' core literacy.

1. Current Situation and Problems of Primary School Mathematics Homework Design

In primary school mathematics teaching, homework, as an indispensable part of the whole teaching process, directly affects the learning effect of students and the final quality^[3]of teaching. However, there are still a series of problems in the current primary school mathematics homework design. Specifically, there are the following questions.

1.1 Neglecting the Cultivation of Core Literacy

Traditional primary school mathematics homework design often neglects the comprehensive cultivation of students' core literacy. Homework focuses on mechanical calculation and application, focusing on the standardization and repeatability of the calculation process, while ignoring the cultivation of students'core qualities such as creative thinking, problem solving ability and communication ability. As a result, students lack motivation and interest in mathematics learning, and their understanding and application ability of mathematics is relatively weak. Primary school mathematics homework should attach importance to the cultivation of students' mathematical thinking, logical thinking and innovative thinking, through the design of inquiry homework, stimulate students' desire to think and explore, and cultivate students' ability to solve problems.

1.2 Lack of Challenge and Inspiration

At present, the design of primary school mathematics homework lacks enough challenge and inspiration, which can not stimulate students'desire for active learning and inquiry. Assignments are often too simple, and the difficulty level is not enough to adapt to the students' learning level and ability development. This makes students lack the process of thinking and exploring when they finish their homework, and lack the ability to find and solve problems. Therefore, primary school mathematics homework design should focus on cultivating students'problem-solving ability and creative

thinking, guiding students to think about the essence and practical application of mathematical problems, designing challenging problems, and stimulating students' interest and motivation in learning.

1.3 Lack of Personalized Design

At present, the design of primary school mathematics homework lacks individualization, which can not meet the learning needs and ability levels of different students. The same assignment is often applicable to the whole class, ignoring the differences and individual development^[4]of students. This leads some students to feel that the assignment is too simple to meet their learning needs, while others may feel that the assignment is too difficult to complete effectively. Therefore, the design of primary school mathematics homework should fully consider the individual differences of students, adopt individualized design strategies, and set individualized homework tasks according to the abilities and characteristics of different students, so as to promote the individualized development and growth of different students.

1.4 Lack of Feedback and Evaluation Mechanism

At present, the design of primary school mathematics homework lacks timely feedback and evaluation mechanism. After the completion of homework, teachers often only pay attention to whether the answers are correct or not, lacking the evaluation and guidance^[5]of students'problem-solving ideas and processes. This makes it difficult for students to find and correct their mistakes, and to gain effective learning experience from their mistakes. Therefore, primary school mathematics homework design should strengthen the evaluation of students' problem-solving process and thinking methods, provide targeted feedback, guide students to analyze and improve their problem-solving methods, so as to promote students' autonomous learning and self-regulation ability.

In a word, the above problems restrict the depth and breadth of primary school students'mathematics learning, and hinder the all-round development of students' core literacy. Therefore, it is necessary to explore and improve the design strategies of primary school mathematics homework in order to promote the all-round development

of students.

2. Primary School Mathematics Homework Design Strategies Based on The Development of Students' core Literacy

This section will propose a set of strategies for elementary mathematics homework design based on the development of students' core literacy to help teachers design challenging, inspiring and personalized homework tasks.

2.1 Integrate the Concept and Goal of Core Literacy

In the design of primary school mathematics homework, first of all, we need to clarify the concept and goal of core literacy. Core literacy includes mathematical thinking ability, communication ability, problem solving ability and other aspects^[6]. The design of homework should be guided by these core qualities, aiming at cultivating students' comprehensive ability and creative thinking. By setting the learning objectives of core literacy in advance, teachers can design homework tasks and evaluation methods to promote students' ability to solve problems, communicate and think critically.

In order to integrate the concept and goal of core literacy, teachers can design homework tasks to encourage students to use mathematical knowledge and skills for inquiry learning. For example, teachers can provide open-ended questions that require students to discover the laws and applications of mathematics through exploration and practice. At the same time, teachers can emphasize the cultivation of mathematical thinking, encourage students to reason, summarize and deduce, and cultivate their logical thinking and abstract thinking ability.

2.2 Design Exploratory Questions and Tasks

In order to stimulate students' interest and initiative in learning, inquiry questions and tasks should be designed for primary school mathematics homework. These problems and tasks should be aimed at guiding students to actively think, explore and discover the laws and applications of mathematics. Teachers can provide some open questions

for students to use their mathematical knowledge and skills to solve problems from different perspectives, so that they can have a deeper understanding of mathematical knowledge in their study.

In order to design inquiry questions and tasks, teachers can consider the following aspects. First of all, guide students to ask questions and explore ways to solve problems independently. For example, a teacher can provide a practical situation in which students are asked to design a solution based on what they have learned. Secondly, students are encouraged to practice and observe, and to summarize the laws of mathematics. For example, teachers can guide students to conduct mathematical experiments, observe changes in data, and help them summarize laws and patterns. In addition, teachers can also design some open inquiry tasks, requiring students to explore independently or cooperatively, and discover ideas and methods to solve mathematical problems.

2.3 Emphasis on Cooperation and Communication

Cooperation and communication is an important link^[7]to cultivate students' communication ability and spirit of cooperation. Primary school mathematics homework design should encourage students to cooperate and communicate, discuss problems with their classmates, share problem-solving ideas and exchange learning experience. Teachers can design some cooperative homework tasks, requiring students to cooperate with each other in groups and solve problems together, so as to expand their way of thinking.

In order to emphasize cooperation and communication, teachers can take the following measures. First of all, organize group activities and ask students to cooperate in completing homework tasks in groups. Teachers can encourage students to discuss and exchange ideas to solve problems together. Secondly, design demonstration and discussion sessions to give students the opportunity to show their problem-solving process and methods, and share and communicate with other students. In addition, teachers can guide students to conduct mutual evaluation and self-evaluation, so that

students can learn from each other's homework and promote each other's growth.

2.4 Personalized Job Design

Individualized homework design is an important way to meet the learning needs of different students. Teachers can design homework tasks of different difficulty and types according to students' learning level and interest characteristics. For personalized assignment design, teachers can consider the following aspects. First of all, we should understand the learning characteristics and ability level of students, and design homework tasks according to their different needs and levels. Secondly, it provides a variety of topic types, including multiple choice questions, application questions, open questions and so on, to meet the learning needs of different students. In addition, teachers can also encourage students to design some personalized homework tasks according to their interests and hobbies, so as to improve students' participation and learning enthusiasm.

2.5 Provide Timely Feedback and Evaluation

In the design of primary school mathematics homework, timely feedback and evaluation are very important for students' learning. Teachers should evaluate students' problem-solving process and answers in time after the completion of homework, and provide specific suggestions and guidance. Evaluation should focus on students' ideas and methods of solving problems, not just on the correctness of answers. Through the evaluation and feedback of students' problem-solving process, teachers can help students find mistakes and improve methods, so as to promote students' autonomous learning and growth.

In order to provide timely feedback and evaluation, teachers can consider the following aspects. Firstly, we should pay attention to the evaluation of problem-solving ideas and methods, encourage students to reason and express reasonably, and cultivate their logical thinking and critical thinking ability. Secondly, according to the different levels of students, personalized evaluation and guidance are provided to help students understand and correct their mistakes. In addition, teachers can encourage students to

evaluate each other and themselves, and promote students' interaction and self-reflection.

The implementation of the above strategies will help to stimulate students' interest and initiative in learning, cultivate students' comprehensive ability and creative thinking, and achieve better teaching results in primary school mathematics education.

3. Case Analysis of the Implementation of Primary School Mathematics Homework Design Based on the Development of Students' Core Literacy

In order to better understand the practical application of primary school mathematics homework design strategies based on the development of students' core literacy, this section will show the specific effects of these strategies in teaching practice through two case studies.

3.1 Case I: Exploring the Characteristics of Geometric Shapes

In this case, the teacher designed an assignment to explore the characteristics of geometric shapes, aiming to develop students' mathematical thinking and problem-solving ability.

Assignment tasks require students to observe various geometric shapes in their surroundings and select a geometric shape of interest to explore. Students need to describe the characteristics of the selected shape, such as the number of sides, the type of angle, symmetry, and so on, and find other shapes with similar characteristics in the environment. Next, students need to summarize the application area of the selected shape, such as architecture, art, etc., and think about how the characteristics of the shape affect its application.

Through this task, students can not only use the geometry knowledge they have learned, but also develop their observation and analysis ability. Students need to think and explore actively to discover the characteristics and applications of geometric shapes. At the same time, students also need to communicate and cooperate, share their findings and observations in groups, and learn from other people's ideas and solutions.

Using a square as an example, students can observe and describe features of a square

such as four equal sides and four right angles. They can also look for other shapes with similar characteristics, such as rectangles and regular pentagons. In the process of exploration, students can think about the application of square in architecture and art, such as the graphic design of buildings and the use of geometric figures in collage art. Through this case, students can not only consolidate their understanding of the characteristics of geometric shapes, but also develop their ability to observe and summarize, as well as to share and communicate with others.

3.2 Case 2: Practical Problem Solving in Mathematics

In this case, the teacher designed a mathematical problem-solving task to develop students' problem-solving and communication skills.

The assignment requires students to collaborate on a practical problem: a rectangular lawn on campus needs to be fenced in. Students need to determine the length of the fence and the cost of the materials. Students need to consider the size of the campus lawn, the material and cost of the fence, and then apply the mathematical knowledge they have learned to solve the problem. In the process of solving problems, students need to measure, calculate and reason, and use appropriate mathematical expressions to show their problem-solving ideas and strategies. Finally, students are required to write a report detailing their problem-solving process and results, as well as suggestions for improvement.

Through this task, students can not only use mathematical knowledge to solve practical problems, but also develop their cooperation and communication skills. Students need to work in teams to solve problems together and demonstrate their ability to think and reason during the process. In addition, students are required to write a report that develops their written expression and critical thinking.

Using the campus lawn fencing problem as an example, students can collaboratively measure the length and width of the lawn and then calculate the cost of the required fence length and materials based on the fence specifications and cost. In the process of solving the problem, students need to consider how to choose the appropriate fence

specifications, how to calculate the length of the fence and the cost of materials. Through teamwork, students can communicate and discuss different problem-solving methods and strategies, and solve problems together. Ultimately, students are also required to write a report detailing their problem-solving process, results, and suggestions for improvement. This case not only helps students apply mathematical knowledge to practical problems, but also develops their ability to cooperate and communicate, as well as their ability to think critically and solve problems.

Through the analysis of the above two cases, we can see that the primary school mathematics homework design strategy based on the development of students' core literacy has a positive effect in practical application, which can stimulate students' interest and initiative in learning, at the same time, cultivate students' comprehensive ability and creative thinking, which is conducive to the improvement of primary school mathematics teaching quality and the progress of students' mathematics learning.

4. Conclusion

This paper studies the design strategy of primary school mathematics homework based on the development of students' core literacy. Through the analysis of the current situation and problems of primary school mathematics homework design, we can see that the traditional homework design has some problems, such as lack of challenge, lack of personalization and inspiration. Therefore, the strategy based on the development of students' core literacy is of great significance.

The design strategies of primary school mathematics homework based on the development of students' core literacy include integrating the concept and goal of core literacy, designing inquiry questions and tasks, emphasizing cooperation and communication, designing personalized homework, and providing timely feedback and evaluation. These strategies can stimulate students' interest and initiative in learning, and cultivate their comprehensive ability and creative thinking. Through the analysis of specific application cases, the effectiveness of these strategies in practical teaching is demonstrated.

The design strategy of primary school mathematics homework based on the development of students' core literacy plays a positive role in improving students' mathematics learning effect. However, future research still needs to further improve the specific implementation methods of primary school mathematics homework design, and further explore its impact on students' learning effectiveness, which will provide useful guidance and enlightenment for the improvement of primary school mathematics education and teachers' professional development.

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