

# The application of task-based teaching method in elementary school mathematics education

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**Abstract:** In contemporary mathematics education, the task-based teaching method has garnered significant attention and exploration as an efficient instructional approach. This article integrates multiple instructional cases to elucidate the concept and characteristics of the task-based teaching method. It delves into the role of task-based teaching method and explores key considerations and issues that should be paid attention to when employing this approach in elementary school mathematics education.

**Key words:** task-based teaching method; elementary school mathematics; practical application

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## 1 Introduction

With the implementation of the new curriculum reform, task-based teaching method has gradually emerged in educational classrooms in China. By introducing task-based teaching method into elementary mathematics instruction, teaching efficiency can be greatly improved. This teaching method, which places students at the center, advocates learning through practice. When teachers apply this method to elementary mathematics instruction, it helps develop students' mathematical thinking, accelerate knowledge internalization, enhance students' learning interest, and stimulate their motivation. Thus, task-based teaching method holds significant application value. Based on the role of task-based teaching method, this paper will focus on how to effectively utilize this method and highlight considerations to ensure successful implementation.

## 2 The concept and characteristics of task-based teaching method

Task-based teaching method is an instructional approach that emerged in the 1980s [1]. It aims to guide students in independent thinking and active exploration through the design of specific learning tasks, allowing them to acquire knowledge, master skills, and enhance their abilities in the process of task completion. This teaching method has been gradually applied to various stages and subjects of education in China since the 21st century. Its remarkable features lie in its task-oriented nature, student-centered, and application-driven approach. Task-based teaching method revolves around learning through practice, combining theory with practice, and providing students with opportunities for practical application and creativity to ensure that they can not only acquire knowledge but also apply it in practical contexts. As task-based teaching method meets the requirements of curriculum reform and caters to students' needs [2], it is worth exploring and actively promoting among teachers.

## 3 The role of task-based teaching method in elementary mathematics instruction

### 3.1 Cultivating students' mathematical thinking

In the instruction of elementary mathematics, task-based teaching method serves as a bridge to build students' logical thinking. Teachers can set diverse tasks to guide students in thinking from different perspectives and solving problems using various strategies, thereby cultivating their divergent thinking and flexible application of theoretical knowledge to practical problems [3]. For example, when learning about "the Position and Movement of Shapes", describing the position of a building A can be done by comparing it to different buildings B and C, such as A being 100 meters southwest of B or 200 meters east of C, fostering students' habit of thinking from multiple angles.

### 3.2 Enhancing students' interest in learning

By setting interesting tasks, teachers can arouse students' interest in the subject matter, which in turn stimulates their curiosity for knowledge. With increased interest, students' attention will be more focused, resulting in better learning outcomes. Task-based teaching method encourages interaction, facilitating teacher-student and student-student collaboration [4]. Through communication and sharing, students' thoughts collide, creating a conducive classroom atmosphere where students actively participate. For example, when studying the "Characteristics of Triangles", teachers can use pegs to form fixed triangle and quadrilateral shapes, allowing students to physically manipulate the figures and compare their differences, intuitively experiencing the stability of triangles.

### 3.3 Strengthening students' internalization of mathematical knowledge

By combining abstract concepts with real-life situations, task-based teaching method helps strengthen students' understanding of abstract concepts [5]. It encourages students to focus on the essence of problem-solving, rather than merely scratching the surface of knowledge. With its targeted, purposeful, and hierarchical nature, this teaching method enables teachers to guide students step by step in deepening their understanding of mathematical knowledge, mastering problem-solving techniques, and developing the ability to apply this knowledge to other contexts. For example, when learning about "the Likelihood of Random Phenomena", students can first perceive simple random phenomena through real-life examples such as "whether it will rain next Monday" or "a bird suddenly flying into the classroom". To further understand the nature of random phenomena, a box containing several differently colored balls can be used, allowing students to partake in interactive activities where they touch and record data, experiencing the concept of randomness.

### 3.4 Promoting student autonomy in learning

Teachers should pose open-ended questions to encourage students to think independently and explore mathematics actively. By cultivating students' attitude and habit of proactive learning, this teaching method lays a solid foundation for their future mathematical learning. During instruction, teachers can adopt heuristic teaching methods, guiding students to actively participate in the problem-solving process. For example, when learning about "Factors and Multiples", teachers can start with the equation  $3 \times 8 = 24$  and prompt students to identify the factors of 24 other than the numbers mentioned in the equation. The same goes for multiples, asking students to identify other numbers for which 24 is a multiple. After class, teachers should assign extension tasks, such as "exploring the relationships between factors and multiples of other numbers", to deepen students' impression of the new knowledge and cultivate their ability to think independently.

## **4 Key points of task-based teaching method in elementary school mathematics teaching**

### 4.1 Designing learning tasks effectively

Firstly, teachers should set specific learning goals for each task and clearly define the tasks that students should complete during the teaching process. Purposeful task-oriented learning can facilitate a more efficient understanding and comprehension of key knowledge points [6]. When designing learning tasks, teachers should follow the principle of content richness and appropriately expand around the central knowledge points. The tasks should be designed with

moderation, neither too simple nor too difficult. Overly simple tasks can lead to a lack of critical thinking and fail to achieve the goal of exercising students' thinking skills, while overly difficult tasks can result in students losing interest and failing to engage in the learning of the current knowledge points. Therefore, teachers should pay attention to students' grasp of knowledge during regular teaching, adjust the difficulty of learning tasks based on students' level, and create conditions for students to fully apply their knowledge without burden. The sequence of task design should progress from easy to difficult and from shallow to deep. Such an arrangement is beneficial for students to quickly get into a learning state and improve learning efficiency.

#### 4.2 Providing conditions for task implementation

When designing tasks, teachers should ensure the effectiveness and feasibility of the tasks and provide conditions for their implementation in relevant scenarios [7]. Teachers can design task scenarios that are closely related to students' life experiences and learning backgrounds, making the learning tasks more practical. Teachers can use common objects familiar to students as teaching tools. For example, when teaching solid geometry, teachers can use a pen case to introduce the edges and faces of a rectangular prism, or use a basketball to familiarize students with a sphere. By observing tangible objects in their surroundings, students can more easily understand the characteristics and properties of these objects. In mathematics teaching, the principle of connecting mathematics with daily life should also be followed, allowing students to experience the charm of mathematics in their daily lives. For example, when learning "Addition and Subtraction of Decimals", in addition to setting scenarios in the classroom, teachers should encourage students to go to shopping malls with their parents to learn related knowledge in practical contexts. For instance, giving students a fixed amount of money, such as 20 yuan, and asking them to calculate how many kilograms of apples they can buy at 3.7 yuan per kilogram. By incorporating mathematics learning into real-life situations, it can avoid students feeling bored during the learning process and allow them to gain practical knowledge. Applying mathematical knowledge to real-life situations is an effective way to assess whether students have digested the knowledge and to identify any gaps that need further reinforcement.

#### 4.3 Providing timely feedback on task completion

Teachers should not only design reasonable tasks and provide learning conditions but also assess students' performance and learning achievements in the tasks, with a focus on the process of task completion [8]. By observing students' performance in tasks, teachers can record their thinking processes, problem-solving methods, and strategies in the classroom to evaluate their mastery of knowledge and provide verbal feedback. It is also necessary to conduct written tests and provide score feedback after completing task-based teaching. This allows teachers to detect knowledge gaps most intuitively and enables students to consolidate their learning more effectively after class. Teachers' evaluations of students should primarily consist of encouragement and affirmation, supplemented by certain material rewards to establish students' confidence in mathematics and stimulate their interest in learning mathematics. Furthermore, encouraging students to express diverse opinions actively helps avoid limiting their thinking and cultivates the habit of multidimensional thinking. Teachers can use students' different viewpoints to raise new questions, allowing students to encounter various ways of thinking through communication and interaction.

### **5 Issues to be aware of in task-based teaching in elementary school mathematics teaching**

#### 5.1 Emphasize posing questions to stimulate students' thinking

In the elementary school stage, students' mathematical thinking still needs improvement, and their thinking is active but has not yet formed a complete system [9]. In task-based teaching, teachers should guide students' thinking by posing questions to direct their thinking and guide their discussions within a certain scope, instead of allowing learning to be free and aimless. Additionally, teachers can help students clarify their thinking and expand their thoughts through prompts and

guidance, encouraging students to apply the knowledge and skills they have learned to solve problems. If teachers fail to guide students' thinking through posing questions in task-based teaching, it may result in difficulties in task progression and low teaching efficiency.

## 5.2 Student-centered learning process

When implementing task-based teaching, teachers should regard students as the masters of the classroom and fully exert their subjectivity [10]. Collaborative learning is an essential means of promoting students' subjectivity. Teachers can facilitate students' cooperation and communication through group discussions, collaborative problem-solving, and other methods. During group discussions, teachers can consider mixing students with different learning abilities in groups, allowing stronger students to guide relatively weaker students to complete collaborative exploration. When engaging in collaborative communication, teachers should avoid excessive involvement and provide students with more independent space for exploration. Teachers should also encourage students to think and express themselves independently. After the cooperative communication, teachers can ask for oral reports from students to showcase their learning outcomes.

## 6 Conclusion

In summary, task-based teaching method plays a crucial role in elementary school mathematics teaching. Task-based teaching acts as a bridge, enabling students to learn and apply mathematical knowledge in practical and real-life contexts, thereby effectively enhancing their mathematical literacy. By reasonably employing task-based teaching method, teachers can promote the improvement of teaching effectiveness.

### Conflicts of interest

The author declares no conflicts of interest regarding the publication of this paper.

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