

Teaching According to Aptitude Varies from Person to Person——A Research on the Design of Mathematical Hierarchical Homework in Senior Grades of Primary Schools

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Abstract: Homework is an indispensable basic link in classroom teaching, an important link in the consolidation of knowledge after class, and an important way for students to understand knowledge, digest knowledge, and improve their problem-solving ability. In the practice of mathematics teaching in primary schools, attention should be paid to the effectiveness of homework assignments in different links before, during and after class, and the content of homework should take into account the reality of students at different levels. This paper expounds the strategy of hierarchical design of mathematics homework from the aspects of the hierarchical design and arrangement of mathematics homework in the upper grades of primary school, aiming to effectively improve the quality of mathematics classroom teaching in the upper grades of primary school.

Keywords: Primary School Mathematics; Senior Grades; Hierarchical Homework

Introduction

Scientific and reasonable homework design is conducive to meeting the characteristic needs of students' development, improving students' mathematical thinking, so that students can get the fun of learning and the feeling of success. The design of hierarchical homework should be implemented according to students' learning status and teaching requirements. According to the characteristics of students' physical and mental development, mathematical learning ability, basic knowledge level and other hierarchical homework requirements, so as to promote students of different levels to achieve balanced development and steady improvement on the basis of their original mathematics, realize the effective value and significance of mathematical homework in a real sense, and lay a solid foundation for students' learning and growth.

1. Elementary school mathematics hierarchical homework design basic principles

Elementary school senior mathematics hierarchical homework design can be based on the following basic principles.

1.1 The principle of hierarchy

Primary school is the basic level of compulsory education. After several years of mathematics curriculum learning practice, senior primary school students gradually diverged in problem-solving ability, knowledge level, practical application and other aspects, showing different gradients. Mathematics hierarchical homework design is helpful for students of different levels to master the knowledge points, so that they can obtain a successful experience and harvest suitable for their learning ability. Avoid uniform homework some students do not have enough to eat, some students can not eat. Not to be able to meet the thirst for knowledge of some students, and seriously bruise some students' confidence in learning.

1.2 The principle of openness

"All roads lead to Rome." For the same mathematical problem, can be analyzed from different angles, with different angles, can

get a variety of completely different answers. In the process of hierarchical homework design, we should fully understand the teaching syllabus, dig deep into the elements of educational value contained in the textbook, and design open exercises tailored for students based on their different knowledge levels and existing mathematical life experience, so as to cultivate their creative thinking. In addition, the design of reference answers to open-ended exercises should leave enough room for possible creative sparks. Teachers should encourage students to put forward the solution ideas and results, as long as it is reasonable, even beyond the common sense of life, should be affirmed, to protect students' different thinking.

1.3 The principle of fun

Interest is the best teacher. The design of math homework for senior students in primary school should be interesting, and we should try our best to avoid giving students some boring exercises. In the design process of mathematics homework, the same teaching content should be presented to students in a multi-dimensional way as far as possible. In class, extracurricular homework layout form, can use the combination of text and text. In terms of content, the content that is closely related to students' real life is selected to arouse students' interest in homework.

1.4 The principle of diversity

Each pupil's intellectual development and characteristics are not the same, their mathematical logic thinking ability, understanding ability is also more or less obvious differences. Therefore, mathematics teachers must pay attention to starting from multiple aspects, multiple practices, as far as possible to fully tap the potential mathematical ability of students, to realize the diversification of mathematical thinking. Therefore, in the process of hierarchical homework design, different training forms should be designed for different students, and different training exercises should be arranged, so that senior math homework is no longer monotonous.

2. Hierarchical design strategy for mathematics homework in senior primary schools

2.1 To understand the students and find out the foundation is the premise of hierarchical homework

2.1.1 Understand students' existing knowledge base

Students' good mathematical foundation is the cornerstone of improving teaching effect. Mathematics subject has a strong logic, mathematical knowledge is linked, if the previous study of addition and subtraction did not master, then the study of multiplication and division will certainly not understand. Even if a teacher asks a student to learn the multiplication table by heart, if a multiplication formula pops up in the middle, the student will have a hard time calculating the result. On the contrary, if the student has a good grasp of the previous knowledge, when he is faced with the same question, he can completely calculate the correct answer. In other words, as long as students' "basic knowledge" structure is intact, it is easier for them to learn new knowledge on this basis, and they have a strong interest in and confidence in further learning new knowledge.

In order to make students make progress from hierarchical homework, teachers can divide students into three levels according to the actual situation of basic mathematical knowledge and their learning potential: layer A, layer B and layer C. Among them, the students in layer A have high IQ, flexible mind, strong response ability, fast problem-solving speed, independent exploration and analysis of problems, problem-solving ability, etc. B layer students have a strong level of intelligence and learning ability, learning attitude is not general, the academic performance is unstable, the main reasons for this kind of students' unsatisfactory performance lies in the non-intellectual factors, such as the lack of hard work, lack of motivation, lack of "ambition"; On the other hand, the students of Layer C are at a low level of intelligence and non-intelligence factors, poor cognitive ability and acceptance ability, and it is difficult to complete daily homework independently. On the basis of students' stratification, homework stratification design has the target and the basis of implementation. At the same time, it also effectively stimulated students' interest in mathematics. Students in the classroom exercises to consolidate the just learned math knowledge, improve the ability to understand the problem. By inspecting the students' exercises in class, the teachers timely grasped the students' understanding of the content of the textbook and the teaching effect of the course.

2.1.2 Understand the ecological environment of students' families

Family is the most influential place for children's growth, parents are the children's initial enlightenment teachers. The stratified assignment of students' homework should take into account the educational level of parents. Parents' attitude towards knowledge and learning also has a deep influence on children to a large extent. Parents have different levels of education, and the education students receive at home, both in terms of content and methods, also presents a world of difference. Different family education children, their learning ability and learning habits are also very different. Knowing the students' home environment, teachers can make the right remedy and avoid placing too high expectations on students with poor home environment. Students at the same learning level cannot simply assign homework at the same level because of their different family environments. Such as parent-child interaction class math homework, some families can not effectively cooperate to help children complete.

2.2 The content difficulty level of math exercises is the key to hierarchical homework

In order to treat and separately meet the learning needs of students at all levels, we must not only satisfy the flourishing thirst for knowledge of excellent students, but also promote students with learning difficulties to meet the minimum requirements of teaching objectives. This is a seemingly irreconcilable contradiction. To deal with this contradiction in mathematics teaching, we must do a good job in the classification of the content difficulty of mathematics exercises. Only through different levels of exercise requirements, can be able to meet the learning needs of children at all levels, truly vary from person to person, individualized teaching, promote the harmonious development of the whole class, overall progress, to achieve differentiated development.

In the face of the objective reality of the differences in all students' mathematical foundation and learning ability, teachers can not avoid, but can only deal with it correctly and actively, understand the "nearest development zone" of students at all levels, customize and clarify the corresponding development goals for them, and design math homework for them with the corresponding difficulty level. Let the students fit into the position and choose the questions independently. According to the development level of the students, the three indexes are determined as A expansion, B improvement and C foundation. The students at level C are required to achieve the most basic learning objectives and try their best to complete the improvement objectives. For B level students to achieve the improvement of learning objectives, try to complete the expansion objectives; For students at level A, we can actively guide them to complete exercises with high exploratory difficulty, including imitative exercises, developmental exercises and variable exercises, etc., so as to realize leapfrog development.

The three types of questions are as follows: the first type is inquiry questions and innovation questions. The purpose of this kind of exercises is to train students' ability of comprehensive mathematical knowledge and test whether students really grasp the new knowledge of high difficulty, so as to achieve the effect of "flexible" application. This kind of exercises are challenging and exploratory. The main layout for A level of mathematics excellent students answer. The second type is to improve the problem, choose to do the problem. This kind of exercises is an improvement of the relevant teaching content in the textbook, which is a simple enhancement on the basis of the original examples in the textbook, and guides students to think and solve problems from a multi-dimensional perspective. Its main purpose is to let students master the basic knowledge of mathematics, at the same time, it can also test the application level of students. The main purpose is to students' mathematics foundation "tamping" degree. These questions are generally suitable for students at A and B levels. The third category is basic and required questions. The difficulty of this kind of exercises is close to typical examples in the textbook, which is relatively simple and easy to solve. As the teacher in the classroom this kind of exercise has spoken deeply and thoroughly, suitable to follow the example. Through classroom exercises and homework, students can strengthen their understanding of knowledge related to such exercises and improve their basic application ability. This kind of exercise is suitable for all students, the most suitable for the C level of students board, can also be promoted to A, B level.

For example, after finishing the teaching of surface area and volume of a cylinder, the teacher can ask the students of Level C to do the routine exercises in the textbook, that is, to find the volume, surface area or weight of a cylinder according to the different conditions provided by the topic; In addition to proficiency in the above exercises, students at Level B are required to give selective answers such as: "A cylindrical warehouse full of wheat has a bottom surface of 12 meters in diameter and a height of 8 meters inside

the warehouse. The stevedores have removed 70 percent of the wheat. How many trucks would it take to carry the rest of the wheat in 8.85 cubic meters per truck?" Such comprehensive problems; Level A students can decide whether or not to do basic routine exercises, but must use a variety of different solutions to comprehensive problems. It can not only strengthen the application awareness of mathematics knowledge for A-level students, but also cultivate their ability to solve problems.

For another example, in the homework design of "division with remainder", teachers can design three sets of question types respectively according to the actual situation for students of different levels to choose. The third basic question is a must for every student: $49 \div 4 = () \dots ()$; $61 \div 7 = () \dots ()$. $55 \div () = 13 \dots \div 5 = 6 \dots 4$. The first is the inquiry question: $76 \div () = 8 \dots ()$ The goal of the required topic exercise is the basic goal of teaching. Ask the students to find the dividend according to the given divisor, quotient and remainder. The inquiry questions are more difficult, requiring students to calculate the divisor and remainder based on the dividend and quotient given. Students at the three levels can choose the questions themselves. Each time they answer a question correctly, they will mark the level they have reached on the corresponding "progress card" according to the difficulty of the question.

Teachers should guide students to complete exercises of different difficulty levels according to their real level. In the process of solving problems of students at all levels, teachers can give timely guidance, especially for those students with learning difficulties at level C, they should pay more attention to, strengthen guidance, improve their learning methods, stimulate their interest in learning, and improve their learning ability. For some typical question types, teachers should perform them in class and sort out scientific problem-solving ideas with blackboard writing, so that students of all levels can improve their ability to solve mathematical problems.

2.3 The amount (time) control of math exercises is the basis of hierarchical work

In addition to classroom work, math homework for students in the upper grades of primary school also includes some extracurricular (home) work. In the current educational background of "reducing burden and increasing efficiency", it is also necessary to assign some basic exercises appropriately, so that students can consolidate the basic knowledge and basic skills learned in class. This involves the amount of math homework (time). The hierarchical requirement of mathematical work volume is also reflected in the time. The poor students spent much more time to solve the same basic problems than the excellent students. Teachers' regulation should ensure that students with learning difficulties can "eat". For good students can require "Tang Qing", that is, daily homework can be completed in class, without extracurricular homework, so that they have more time to expand outside the classroom; For medium students can be "every day clear", "Zhou Zhou clear". Students with learning difficulties can be separately tutored after class "every day clear".

Excellent students can choose some extended exercises after finishing the basic exercises. They have a choice about that. Appropriate and timely homework requirements can effectively help students to have a successful experience and develop confidence in learning.

For example, after learning the Problem of Planting Trees, the teacher can design a set of exercises: (1) A square stadium with a circumference of 880M is equipped with a lamp every 8M. How many lights can be installed in total? For a square stadium with a side length of 220M, one light should be installed every 8M. How many lights can be installed in total? (3) In a square stadium with a side length of 220M, there is an electric pole every 8M, and two underground lamps are installed between each pole. Q: How many underground lamps can be installed in total? Such hierarchical work effectively reduces the amount of homework, but also allows the training of students of different levels to be in their proper place.

3. Conclusion

To sum up, teachers should reflect the hierarchical work design of mathematics in daily class work, extracurricular work, written work and activity work, so that students at different levels can benefit from their own work fields. Of course, the design and guidance of stratified homework requires teachers to pay more efforts. Only by careful research, in-depth study and careful screening, can we design stratified homework suitable for students, effectively enhance the interest in mathematics learning and improve the teaching efficiency of mathematics classroom.

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