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RESEARCH ARTICLE

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Research on Unit Knowledge Structure Teaching from the Perspective of Advanced Learning

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Abstract: Based on the knowledge structure of integrated units, it emphasizes that every knowledge point should be put into the complete unit knowledge structure to understand, so that learners can be promoted from the previous structure level and single-point structure level to the multi-point structure level, from the multi-point structure level to the related structure level, and from the related structure level to the abstract expansion level.Through the teaching of the meaning and nature of scores, the teaching strategy of unit knowledge after the festival of advanced knowledge is established.

Keywords: advanced knowledge theory; unit knowledge structure; teaching innovation

1. Introduction

With the gradual deepening of curriculum reform, primary school mathematics teaching especially attaches importance to the "student-oriented"(Li & Xu, 2017), paying attention to the all-around development of students. But most of the teachers teaching focus on the segmentation unit, ignoring the students' mathematics knowledge system built under the overall, causes students to appear in the integrated application of mathematical knowledge can not be timely call related knowledge, and in further study related knowledge disconnection, difficult to break through the situation, more difficult to get a good development on mathematics. This paper proposes a kind of unit knowledge structure teaching and studies its teaching design based on the perspective of knowledge progression, to provide effective teaching design suggestions, so that students' learning has structure and they can get better development in mathematics.

2. Theories Related to Learning Progression

2.1 Ausubel's Theory of Meaningful Learning

The theory of meaningful learning emphasizes the establishment of connections between new knowledge and old knowledge in the original cognitive structure. The teaching of unit knowledge structure proposed in this paper is based on the development of this theory, and mainly seeks the breakthrough of students' learning ability in the following two aspects. In teaching, teachers must organize learning materials reasonably according to the structure of mathematical knowledge, and help students to form and perfect their mathematical cognitive structure. At the same time, based on the learning psychology of students' unit knowledge structure, teachers should try their best to improve students' learning orientation in a meaningful way, such as designing appropriately challenging questions and presenting materials that fit students' interests.

1.2 Babansky's Theory of Teaching Optimization

The optimization theory of the teaching process emphasizes that teaching is regarded as a system, through properly deals with the relationship between the whole and the part of the selection of the optimal teaching process and method, according to the characteristics of the students to teach(Liu, 2018). The teaching of the unit knowledge structure proposed in this paper is similar to its theory. Teachers must first grasp the units from the global knowledge structure, secondly, to analyze students have mastered the knowledge, all the students with different learning levels of pupils' personality characteristics, for

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students to organize the learned knowledge system and the connection between knowledge points, prompting students to study efficiently, effectively develop the students' learning ability, guide students to learn knowledge level enhances unceasingly.

1.3 SOLO Classification Theory

SOLO(Lu, 2021)， short for"structure of Observed Learning Outcomes", is a qualitative evaluation method characterized by hierarchical descriptions. The SOLO classification framework is used to evaluate the thinking level of individuals in the process of problem-solving, including five levels: pre-structure, single-point structure, multi-point structure, associative structure and abstract extension structure. At the pre-structure level, students fail to understand the problem and can only give logical or unfounded answers, which means they are in a state of"no learning".At the single-point structure level, students can only preliminarily understand concepts or materials, and can only give a single idea of problem-solving or make a mechanical statement about the problem. The multi-point structure level means that students can find various ideas to solve problems, but cannot integrate them systematically, and can only make isolated or scattered judgments and statements. The relational structure level refers to the ability of students to solve problems in the same discipline or knowledge system by associating multiple specific problems in similar situations.

3. The Method to Achieve Learning Progress

3.1 Students at The Pre-structure Level And Single Point Structure Level are Promoted to The Multi-point Structure Level

By paying attention to the whole process of collecting and sorting out mathematical information, students are encouraged to form the habit of examining questions carefully, analyzing quantitative relations and operating(Farzad et al., 2022). At the same time, students can accumulate perceptual knowledge and enrich their experience in mathematical activities, so that students can move from the pre-structure level to the multi-point structure level. Most of the students in the pre-structure level and single-point structure level mainly show that they do not understand the meaning of the question or answer eagerly, ignore the examination of the question, read information and sort out mathematical information. Therefore, teachers should pay attention to the cultivation of students' examination consciousness, and the collection and arrangement of mathematical information should not be ignored.

3.2 Students at The Multi-Point Structure Level Should Improve to The Related Structure Level

Students from the face of mathematical information panic to be able to systematically integrate, and can be combined with text and text and other ways to express it in language, which is an important sign to the level of relational structure.

3.3 Students at the level of correlation structure improve to the level of abstract expansion

Students can deeply understand theoretical knowledge through a variety of representations(Jordan et al., 2021). Moreover, students have the ability of generalization and generalization, and excellent mathematical literacy. Teachers should encourage students to use different methods to represent their ideas and to reveal the mathematical essence behind different representations. To promote the level of abstraction and expansion, the key is to grasp the essence of the subject and establish a mathematical model. In teaching, teachers should guide students to summarize, and get the operation rules of fractions multiplied by fractions: fractions multiplied by fractions, numerator multiplied by product, numerator multiplied by the denominator, can reduce the fraction to reduce the fraction and then calculate, the final result should be expressed by the simplest fraction.

4. The Application of Learning Advanced Theory in The Unit Teaching of The Meaning and Nature of Fractions

4.1 Pay attention to Sorting out Mathematical Information to Achieve The Improvement of the Multi-point Structure Level

In the teaching of this unit, we should pay attention to the student's ability to sort out mathematical information and understand the meaning of the question. Pay attention to sorting out the quantity relationship, get the correct relationship equation; Attach importance to hands-on operation and accumulation of experience(Xie, 2021). We are like the score and the significance, into two cake

among eight students, how to points to ensure that each student as much to this question, many of the students is unclear topic meaning, behind the struggle with that sentence, the key is"to ensure that the assigned to each student as much", we need to read the topic and to collect information. This leads to the use of fractions to solve, and from the previous sentence can be listed mathematical relations, So you get a quarter piece for each student, and students can carry out the practical operation, do it themselves, in the verification of the results at the same time accumulate experience. In daily learning, through reading collecting useful information for problem-solving is very important, many students began to do, did not see the topic request and contains knowledge， leading to error, so it is necessary to guide students to foster awareness of the topic and develop the students' ability of information collection, this is a help in learning any student knowledge acquisition. In solving problems and reading problems to experience the fun of life and mathematics, it is easier for students to move from the previous structure level, the single-point structure level to the multi-point structure level(Xu, 2016).

4.2 Attach Importance to Language Expression and improve the I eve I

of association structure.

When teaching, teachers should help students understand the meaning of scores through graphic representations; Pay attention to students' language expression and promote the development of students' abstract thinking[8]. At the beginning of learning the application problem of fractional multiplication, students usually only solve the problem by the meaning of fractional multiplication, but they do not understand the unit "1" well and cannot accurately express the unit“1”， which will affect the subsequent learning. Therefore, teachers should exercise students' ability to draw diagrams after clarifying quantitative relations. In the practice homework of assigning the word problems of fractional multiplication, students should be required to first draw pictures to represent the quantitative relations contained in them after sorting out the mathematical information, and then solve the problems in a sequence. By training students to represent the images, students should be promoted to the level of the correlation structure. When comparing, students need to understand the basic nature of fractions, proficiently use the knowledge of the least common multiple, master the method of general fractions, and fully combine the knowledge with application. First of all, students need to master the general method of general fractions --reducing them to fractions with the same denominator. Looking for the least common multiple of the denominator.6 and 8 are not coprime. Their least common multiple is 24. In the case of common fractions, not only should the denominator be" common"， but the numerator should also be expanded by the same multiple. This is where students tend to make mistakes. Some students find it difficult to describe how to solve the problem in terms of the meaning of fractions and units of fractions. The teacher can train the students to draw a picture to show the meaning of and. Drawing a circle or a line segment for unit "1" can be interpreted as dividing unit "1" equally into six parts and taking five of them. can be understood as dividing the same unit "1" evenly into 8 parts, taking 3 of them, the number of parts increases, each part decreases, and the number of parts taken decreases, obviously ＞.

4.3 Pay Attention to a Variety of Representations to Achieve the Level of Abstraction and Expansion

To learn the level of abstraction and generalization, it is necessary to have a certain theoretical basis of knowledge. After learning the concept of unit "1” initially, we should continue to penetrate the concept in the later in-depth study and learning in practice. Specific can be shown in: in teaching， we should attach importance to understanding unit 1 deeply through multiple representations. In teaching， we should also pay attention to generalization and improve mathematical literacy. The method of induction and deduction is used in score 1 earning. In the score 1 earning of primary school mathematics, a key basis is the study of the concept of unit 1， which requires students to grasp the concept deeply through multiple specific problems of the same situation and complete the problem-solving within the system. An object, a unit of measurement or several objects can be regarded as unit 1.

5. Conclusion

This paper analyzes the teaching of the meaning and nature of scores by using the theory of learning progression,

explores the path of learning progression, and makes corresponding research for improving the teaching effect.

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Conflict of Interest

The authors declare that they have no conflicts of interest to this work.

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