A Study of Elementary School Mathematics Curriculum Based on a Big Idea Perspective

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Abstract: The construction of big idea has a significant impact on the transfer of knowledge in mathematics learning, and the combination of the connotation of big idea and the characteristics of elementary school mathematics curriculum can help optimize the elementary school mathematics curriculum and implement the core literacy in mathematics. Based on the perspective of big idea, we analyze the current situation of elementary school mathematics teaching and learning. The course presents the basic framework and implementation methods of primary school mathematics curriculum under the big idea.

1. Introduction

The Compulsory Education Curriculum Standards require teachers to sort out and study the conceptual system from the big idea and establish a framework for students' progressive learning development. In recent years, the research on the theory and application of "big idea" has become a hot topic in China's research field, which is not unfounded but has profound theoretical basis and practical significance. In 2018, The National Education Conference proposed to strive to build an education system for the comprehensive cultivation of moral, intellectual, physical, social and aesthetic development, and to continuously promote the comprehensive development of students' moral, intellectual, physical, social and aesthetic development, which is a major proposition and a major issue raised by the reform and development of Chinese education in the new era. The one-sided development of the five basic aspects of moral, intellectual, physical, aesthetic and labor is not comprehensive development, nor is the simple sum of the five basic aspects of moral, intellectual, physical, aesthetic and labor comprehensive development, which is the overall development of moral, intellectual, physical, aesthetic and labor, and is the integration of the five educations.

How to promote students' all-round development through classroom teaching is the need for reform of classroom teaching today. In this way, whether it is the development of students' core literacy or the cultivation of students' all-round development, `there is a need for a teaching style that tends to be integrated：

(1)The big idea is the core concept at the center of the discipline, which is what Ausubel called the superior concept, and it is the essential characteristic of sifting and integrating knowledge from facts, phenomena and concepts by its high generality and abstraction.

(2)The big idea is structural. The big ideas are like a longitudinal and extended network framework, with different levels of abstraction vertically, and scattered knowledge, skills and methods arranged horizontally and vertically to help students achieve an overall understanding of the concepts.

(3)The big ideas have the property of transferability. The knowledge contained in big ideas is extensive and therefore acquired slowly, which makes them relatively long-lasting.

They can be transferred and applied in intra-subject contexts, inter-subject contexts, and contexts outside school, mainly including the construction and transfer of knowledge and values, which not only promote students' deep understanding of big ideas themselves, but also help students This not only promotes a deeper understanding of the concepts themselves, but also helps students to build

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their knowledge system.

In his mathematics research, Professor Wang Shangzhi suggested that Chinese students should possess six core mathematical literacies: mathematical abstraction, logical reasoning, mathematical modeling, mathematical operations, intuitive imagination, and data analysis [1]. In compulsory primary education, "exploring patterns" has become an important way to develop students' core literacy in mathematics and to foster their sense of application and innovation. In order to facilitate the development of students' core literacy, many editions of mathematics textbooks have modified and processed "exploring patterns". One of the primary mathematics textbooks has a special section on the topic of "multiplying decimals". Therefore, a study of the content of "multiplying decimals" is of some reference value.

From the perspective of big ideas to mathematics mathematics teaching has important significance, in terms of theory, firstly, exploring the value of using big ideas is beneficial to the implementation of core literacy in teaching. With the introduction of core literacy, the integration of knowledge content through big ideas in the process of teaching elementary school mathematics is of great significance in promoting the implementation of core literacy in the subject [2]. Second, the use of big ideas in mathematics teaching is conducive to the realization of subject education. Integrating curriculum knowledge around big ideas can deepen conceptual understanding and promote the transfer of knowledge. Under the guidance of cognitive theory, the teaching design using big ideas can achieve the sixfold disciplinary education of subject knowledge, subject skills, subject activities, subject ideas, subject culture and subject life. The elementary school mathematics curriculum involves more knowledge points, and students are prone to the phenomenon of learning and forgetting. Unit teaching connects knowledge points into a unit framework, which creates conditions for systematic learning, while the big idea gives the core of the knowledge system intrinsically, which has positive significance for strengthening students' overall learning of knowledge. Third, science education is an important part of basic education, and the mathematics curriculum carries the burden of science education. For science education, the cultivation of students' scientific thinking is the key content. The teaching of elementary school mathematics from the perspective of big ideas helps students grasp the learning content from the perspective of induction, synthesis and analysis, and is a powerful aid to the cultivation and development of students' scientific thinking. Fourth, cultivating core literacy. Core literacy is the theme of the current curriculum teaching, and occupies an important position in students' deep grasp of the curriculum content. The core literacy of elementary school mathematics contains multiple contents such as mathematical operations, rational thinking, social responsibility, etc., and the core literacy of the big idea can be shown in the specific performance of each unit. Teaching elementary school from a big idea perspective can help develop students' core literacy [3].

Based on the practical significance:

(1) By using big ideas to build knowledge structures, teachers can organically integrate course contents in preparing, teaching, and summarizing, which provides some reference for front-line teachers to integrate teaching contents.

(2) Second, exploring the teaching design model based on big ideas has positive implications for front-line teachers' teaching practice. This paper combines big ideas with teaching guided by embodied cognitive theory to design an embodied teaching design model based on big ideas, which promotes education and teaching to a certain extent and helps front-line teachers to innovate in the way of education and teaching.

(3) The practical research proposed for front-line classroom teaching problems aims to solve the existing teaching practice problems, so it has both "teacher teaching" and "student learning" values in practical sense. For teachers, the "Big Idea-based Primary Mathematics Curriculum Study" is different from the traditional individual teacher design, emphasizing the team design and the high occupation of the teacher design concept. For students, the ultimate direction of this study's unit instructional design is to obtain an integrated knowledge framework and achieve flexible knowledge transfer [4].

2. Concept Definition

2.1. Big Idea

The main content of big ideas is the more fundamental and salient definitions and ideas that exist behind the content of relevant subject knowledge. With the new curriculum standards, the new version of the teaching standards for primary mathematics requires the use of big ideas [5]. Big idea knowledge in mathematics teaching is located at the top of the conceptual knowledge system and has very systematic, abstract and extensive characteristics that increase the connection and application of knowledge. According to the characteristics of the big ideas and the different levels, the knowledge of elementary mathematics is divided into several big ideas in terms of the core of the subject, its development and the value of the subject. In the actual teaching, the major roles of the big ideas in teaching objectives, teaching evaluation, and teaching practices are fully utilized.

By integrating the curriculum content of each subject through the big ideas, conceptual knowledge is formed and the development of students' subject core literacy is implemented. The formation of conceptual knowledge means that the student, on the basis of learning to know this knowledge, acquires the ability to further understand the characteristics of the concept, to use it as a tool to analyze other new situations, i.e., to achieve learning transfer, to constantly acquire higher concepts and knowledge, and to have the significance of the methodological value level [6]. Such conceptual knowledge can be independent of the factual level, pointing to deeper thinking, promoting single points of knowledge towards integration and abstract thinking, i.e., achieving knowledge integration, realizing the promotion of higher-order learning to lower-order learning, providing a complete learning framework, and having the significance of the knowledge value level.

Therefore, by reading the definitions and narratives of big ideas given in the literature and the commonalities between the description definitions of big ideas given by different scholars, combined with the requirements of project learning for knowledge integration as well as contextuality and deep learning, this study considers the definition of big ideas in this paper:A big idea is a collection of conceptual relationships that can have methodological and intellectual values, and is both a framework for instructional design and It is the basic idea of instructional design, the core of disciplinary concept learning, capable of coherently integrating disciplinary knowledge and understanding into a large collection, with integration, and at the same time beyond a single knowledge point, with abstraction and thoughtfulness, capable of organizing and transferring knowledge, and with such an aggregate as the core of instructional design can promote students' deep understanding of knowledge, and such an aggregate is called a big idea [7].

2.2. Elementary School Mathematics

Elementary school mathematics is a series of materials that teach students about number recognition, the four operations, formulas for calculating graphs and lengths, and unit conversions, laying a good mathematical foundation for middle school and everyday computing. According to the Dutch educator Freidenauer, "Mathematics comes from reality and must also be rooted in reality and applied to reality." Indeed, modern mathematics requires students to see the world through mathematical eyes and to elaborate on it in mathematical terms. From the viewpoint of elementary school students' mathematics learning psychology, students' learning process is not a passive absorption process, but a reconstructive process based on existing knowledge and experience; therefore, learning by doing, learning by playing, and transforming abstract mathematical relationships into familiar examples in students' lives will make children learn more actively [8]. In terms of educational objectives, teachers should pay more attention to developing students' comprehensive skills such as observation, analysis and application while imparting knowledge.

2.3. Mathematics Big Idea

The big idea has a relative nature, the big idea implemented in the specific performance of mathematical disciplines is the big idea of mathematics. Here mathematical big ideas refer to principles, ideas and methods that reflect the essence of the mathematical discipline, reside in the center of the mathematical discipline, and have wider applicability and explanatory power. The

mathematical big ideas are a networked structure consisting of four levels vertically (subject big ideas, inter-unit big ideas, intra-unit big ideas, and intra-class big ideas) and three types horizontally (content-based mathematical big ideas, process-based mathematical big ideas, and value-based mathematical big ideas). In this study, mathematical big ideas are described as equivalent to big ideas for the sake of narrative convenience, if not otherwise specified.

3. Analysis of the Current Situation

3.1. Teachers' poor Awareness of Mathematical Knowledge Linkage and Inefficient Integration

In the current elementary school mathematics teaching, some mathematics teachers have poor awareness of associated knowledge, the teaching effect of knowledge integration practice is average, some elementary school mathematics teachers do not summarize and categorize the overall teaching content when they carry out teaching, or they do not explain coherently the knowledge points associated between units, etc., which will lead to poor integration efficiency of elementary school mathematics teaching, and they cannot carry out efficient primary mathematics integrated teaching, which affects the overall teaching efficiency [8]. In addition, the knowledge points in each unit of elementary school mathematics have strong coherence, and if teachers do not teach unit coherence in their teaching will lead to a decrease in teaching efficiency, which affects the effective development of elementary school mathematics teaching under the big idea perspective, and also affects the development of students' comprehensive ability.

3.2. Lack of Dourse Review to Guide Students to Relate Knowledge

In addition to not teaching related knowledge, teachers do not review the content of the curriculum at the beginning of the course, and often teach new knowledge directly, which can complete the teaching task but cannot cultivate students' thinking of related knowledge or improve the teaching efficiency of elementary school mathematics [9]. In contrast, elementary school mathematics teaching under the big idea perspective focuses on the development of comprehensive ability and mathematical literacy of primary school students, however, teachers do not organize students to conduct unit review in the curriculum teaching will lead to the slow entry of elementary school students into the classroom learning state and lower learning efficiency, thus affecting the cultivation of elementary school students' core literacy in mathematics and elementary school mathematics teaching under the big idea perspective.

3.3. Students' ability to Observe, Compare, Analyze and Commonality is Weak

Acquiring information through observation and then processing it by thinking, such as comparing, analyzing, and classifying, in order to reveal the relationship or nature of things, is the key process of exploring laws. It can be found through the test that there are some missing activities of this key process of exploring laws, which makes students' process of exploring laws interrupted, and most of the students only find some of the laws and are at the low stage level of getting the conclusion of the laws [10]. It can be seen that students usually seldom carry out the activity of exploring laws, have a low awareness of exploring laws, and lack the exercise of exploring law thinking, thus leading to the weak ability of students to observe, compare, analyze and find commonalities, and only a small percentage of students can find laws and apply them.

3.4. Teachers Don’t Focus on the Process of Law Exploration

The focus of "exploring laws" should be on the process of students' exploration of how to get the conclusion of the law, in which students feel and experience the abstract mathematical ideas by solving intuitive and concrete problems, and it is crucial to master the method of exploring laws. Process is extraordinary [11]. However, in teachers' lesson plan design and classroom, teachers still focus on the didactic approach, giving students relatively little free space and failing to give full play to students' main role.

4. Discussion

4.1. Essentials of Teaching Elementary School Mathematics from a Big Idea Perspective

The theoretical research and practical exploration of big idea teaching are in the initial stage. This chapter mainly elaborates the concept and implementation points of big idea teaching in elementary school mathematics, and points out the core teaching points such as teaching objectives, implementation unit carrier, teaching implementation path, and teaching implementation evaluation of big idea teaching.

4.1.1. Identify Teaching Objectives and Big Idea

Reading a lot of literature shows that teaching big ideas requires appropriate instructional design, and the premise is to change the goal of teaching. In fact, if the teaching for the test, will produce some simple speculative teaching and learning behavior. Therefore, this study argues for a shift from teaching conclusions to "teaching for understanding," "teaching for thinking," "teaching for literacy," and "teaching for truth." The first prerequisite for teaching big ideas is to change the teaching objectives [12]. At present, teaching for literacy is a hot topic and research hotspot in the basic education curriculum reform, and it is easy to see that the highlight of the new round of curriculum reform is the reform of teaching objectives, and the key to teaching big ideas is also the transformation of teaching objectives.[13]

The transformation of teaching objectives and the identification of big ideas are the primary links that complement big idea teaching, and the teaching objectives mentioned here are relatively abstract, such as "teaching for thinking," "teaching for literacy," "teaching for truth For example, "teaching for thinking," "teaching for literacy," "teaching for truth," "teaching for understanding," these big ideas of teaching are abstract or rather broad, implemented in specific mathematics courses, further to specific chapters and sections, in order to make the teaching goals in practice, need to put forward clear big ideas to control the teaching goals, grasp the direction of teaching, for In order to make the teaching objectives come true, clear big ideas are needed to control the teaching objectives and grasp the direction of teaching and learning.

4.1.2. Selecting the right unit as a carrier

In order to carry out the subsequent unit teaching design, the first thing that should be considered is in what way to choose the unit content. At present, using the curriculum standards and textbook chapters as the theme is the general teaching design to follow the unit structure, the compulsory education curriculum standards are relatively single, and each unit module is distributed in each school section according to the learning progression, thus it can be seen that the textbook, as the most important text carrier of the core literacy of mathematics, its chapter arrangement and In the teaching process, the most common and convenient way is to organize the content of the modules according to the themes of the standards and the chapters of the textbook. However, such a "module-section-unit" form of knowledge construction makes it difficult for students to have a comprehensive understanding of the same module knowledge, and it is difficult to improve students' overall ability with fragmented cognition, which is not conducive to the development and implementation of students' core literacy in mathematics. In addition, concepts and concepts do not exist independently, but form relevant connections between them when solving different problems, and only focusing on the learning and mastery of a single concept is not enough to solve comprehensive problems [14].

In this paper, we use the actual situation as the starting point of the problem, and use the core concepts to guide the whole project learning. The driving problem can decompose the core concepts into sub-concepts, which can help students sort out the hierarchical relationship between sub-concepts and core concepts, and also establish the connection between concepts and concepts. Once the connections are established, the basic ideas of problem solving are also clarified, which is helpful to enhance students' interest in learning, exploration and knowledge integration. Therefore, by carrying out project-based learning, students can experience the process of concept generation, integrate fragmented knowledge points, obtain interconnection between concepts and generate the

final big idea.

The landing of core literacy in elementary school mathematics can refer to the knowledge system of big ideas. Therefore, it is necessary to refine the big ideas, screen the sub-concepts according to students' cognitive development level and developmental needs at this stage, and use this sub-concept and the big idea as the main content of the unit teaching.-

4.1.3. Standardize Instructional Design and Implementation

Big idea teaching is a kind of teaching concept, and the previous study has pointed out the implementation points of big idea teaching, the specific implementation requires teachers' own wise decisions, for example, determining teaching objectives and big ideas, transforming teaching objectives is the primary feature of big idea teaching, the determination of teaching objectives and the refinement of big ideas are complementary, therefore, this is the first step of big idea teaching, and it is also the first step that teachers need to undertake Specifically, at the beginning of teaching a course, teachers should, on the basis of careful study of the textbook and other relevant materials, clarify the context of knowledge and grasp the ideas and methods behind the knowledge, so as to determine the teaching objectives and the distilled big ideas, considering both the big ideas of the whole book and the big ideas of each chapter [15].

In specific teaching, the content should also be reorganized, units of instruction should be identified, and the big ideas of the units should be refined. For teaching objectives, students are informed as much as possible in advance in order to carry out learning with clear objectives, it should be noted that not every teaching objective can be communicated to students in an unambiguous way, there are some techniques, and teachers' experience with their implementation is in two ways: one way: the learning objectives of the chapter, section, and this lesson are communicated clearly before the lesson; the other way: the learning objectives are introduced with reservations. Some learning objectives, even if communicated to the students, are not "effectively received" by the students and are influenced by a variety of factors, such as the students' basic knowledge and understanding [16].

4.1.4. Transformation of Evaluation

Evaluation research is a very complex issue, and it is beyond the scope of this study to carry out this work on evaluation methods in detail, but it must be emphasized that evaluation is a guiding role, and the change of evaluation methods must be emphasized. In addition to the regular exercises, this study believes that a reflection link should be added, requiring students to write a reflection on each chapter after learning the content of the chapter without too many restrictions. You can study the knowledge structure of the chapter, you can reflect on the learning experience of the chapter, you can introduce your own learning process, in which knowledge point you encountered difficulties in learning, or, which knowledge point left a deep impression, you can also write about the feelings of classroom teaching, the current teaching style is not the same as the previous teaching style, it is because there are not too many restrictions, this paper collected feedback from all aspects. This valuable feedback became another form of teacher-student communication, and gained valuable information for this paper to understand the effectiveness of this big idea teaching practice.

The assessment of the Big Idea-based unit is a comprehensive assessment, which includes both how the teacher designs the assessment and how the students self-assess: from the stage perspective, it covers both the summative assessment of the stage learning and the process assessment of the diagnostic planning [17]. Among them, process assessment is the stage assessment of students' learning, performance in the big idea learning process, and in unit teaching process assessment emphasizes the role of encouragement for students, and process assessment usually occurs during the unit learning activities.

The process evaluation in unit teaching includes: students' classroom behavior performance, learning performance, etc. The process evaluation occurs with more emphasis on the adjustment and encouragement of students' learning behavior after the implementation of the evaluation to ensure the effective teaching and learning, and the summative evaluation is the evaluation of the

development results of the big idea, which points to the development of students' literacy through learning. The evaluation of the unit teaching design based on big ideas, whether it is process evaluation or summative evaluation, the evaluation of different subjects of students' self-evaluation, students' mutual evaluation and teachers' evaluation happens in the teaching session all the time.

4.2. Practical Examples of Elementary School Mathematics Curriculum from a Big Idea Perspective

Based on the framework and basic aspects of the big idea-based elementary school mathematics unit instructional design constructed in the previous paper, typical unit contents in elementary school mathematics are selected for unit instructional design to build a bridge between theoretical guidance and implementation practice and to provide teachers with referenceable cases.

4.2.1. Build a Big Idea System

Regarding the extraction of big ideas, two ideas have been mentioned: one is top-down extraction from curriculum standards and core literacy, and the other is bottom-up extraction from life experience and textbook content [18]. However, it is challenging for front-line teachers to understand the big ideas accurately, refine the subordinate big ideas or small concepts according to the specific situation of students' cognitive development and teaching implementation, and find the key points and difficulties of teaching. Are challenging. The latter process of extracting big ideas from the bottom up and deepening the understanding of things is the process of constantly constructing big ideas, which is undoubtedly the best way for teachers to understand big ideas in depth and accurately, but whether they can be raised to the level of big ideas from the right direction requires teachers to, firstly, discover specific cases from life experiences, secondly, link life experiences and pedagogical knowledge, keep asking questions and thinking about the upper big ideas This is also not easy for teachers. Therefore, the construction of any big idea system is the result of a combination of multiple paths, and the establishment of a big idea system is analyzed below through specific cases [19]. Since the curriculum standards, as the guiding document for subject teaching, provide an overall picture of what students can achieve through learning, the big ideas are mainly extracted and obtained from the curriculum standards, and the sub-concepts need to be sorted out based on a familiar understanding of the content of the textbook.

4.2.2. Determine Unit Content and Objectives

The first is whether there is a possibility of integrating "decimal multiplication", i.e., whether it is possible to explore the larger concept behind the concept. First of all, the material analysis, before learning "decimal multiplication", students have already learned the multiplication of integers, the meaning and properties of decimals, addition and subtraction of decimals, these two units focus on learning the multiplication of decimals by integers, multiplication of decimals by decimals, approximation of products, etc., which establishes the basis for further learning the interconversion between fractions, decimals and percentages and fractions The two units focus on multiplying decimals by whole numbers, multiplying decimals by decimals, and approximating products. The structure of both units starts with "multiplying decimals by integers", then "transferring to decimals", then "approximating the product", and then "The laws of integer operations and multiplication extend to decimals, and finally, "problem solving". The essence of the calculation of "decimal multiplication" is "multiplication and subdivision of units", which lays the foundation for the integration of the unit [20]. How to sort out the superordinate concepts of "multiplication of decimals"? In accordance with the requirements of the Compulsory Education Curriculum and the internal logic of knowledge development, the hierarchy of the big ideas is organized and the learning process of the big ideas is clarified. Students can transfer the meaning of multiplication of whole numbers to the meaning of multiplication of decimals in this unit. Essentially, they are all about finding the sum of several identical addends, and for decimal multiplication, students can work through the calculation of multiplying whole numbers, as shown in Figure 1.

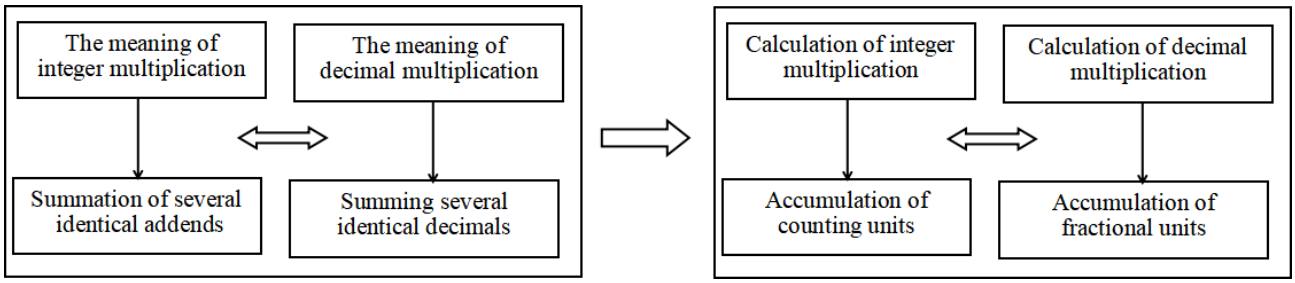

Figure 1 Decimal multiplication unit concept generation path

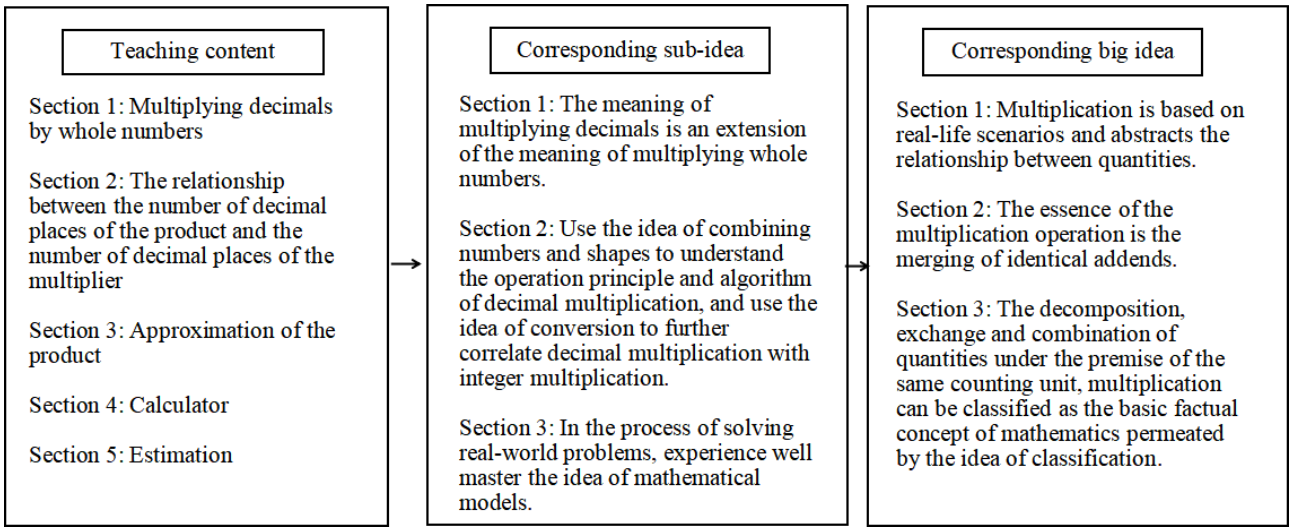

Figure 2 Decimal multiplication unit concept content

As can be seen from Figure 2, students' ideas, methods, and ways of thinking about multiplication of decimals are all derived by analogy from the multiplication of integers.

4.2.3. Building a System of Questions

The big ideas are externalized in the form of problems, so it is necessary to build a problem system around the big ideas. As shown in Figure 3, the big idea of the unit is transformed into the basic question "What is the connection between multiplication of decimals and multiplication of integers?" The basic problem is then broken down into sub-problems, and each sub-problem is subdivided into problems, thus forming a problem system that focuses on the big idea of the unit. Teachers need to consider the following factors when setting problems:

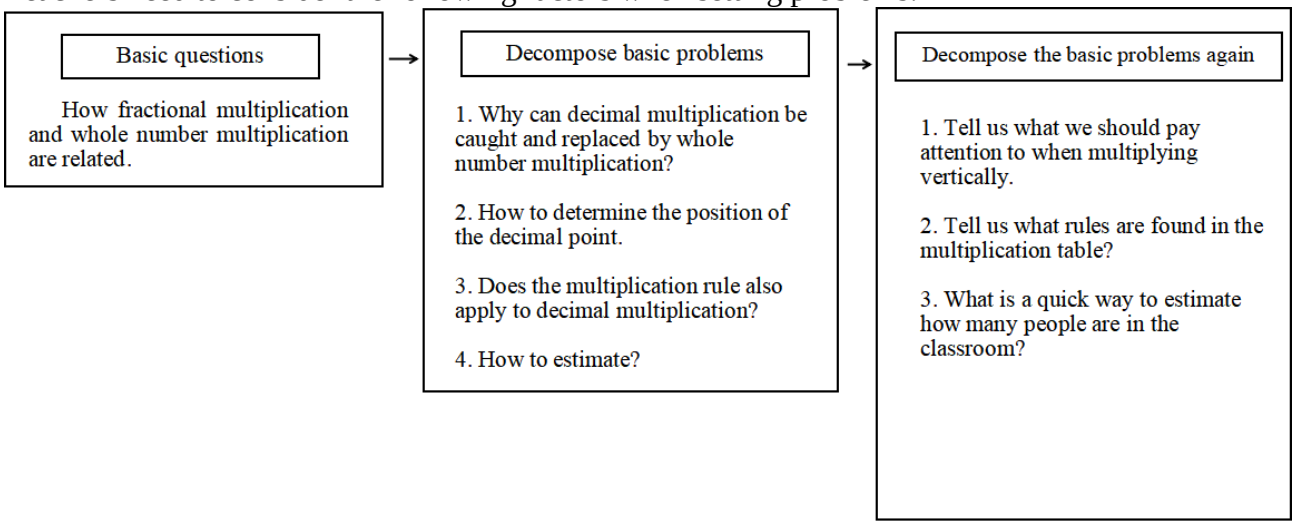

Figure 3 Decimal multiplication problem design

(1)Whether students' interest in learning is stimulated by the created problems, so that students

have the interest to continue to explore.

(2)Whether students' life experience is activated by the created problems.

(3)Whether the construction of the problems is suitable for students' developmental level, according to the nearest developmental zone, students can "jump" to get the "fruit" to obtain the "fruit".

4.2.4. Create Learning Activities for Teachers and Students

Students' construction of big ideas is the process of continuously constructing their own understanding of concepts by experiencing, accumulating, generating and other cyclic links in a large number of learning activities. This practical activity combines comprehensiveness and hierarchy, and links relevance and practice, so that students can understand, apply and transfer big ideas from multiple perspectives, form an overall understanding of concepts from the surface, and realize the development of disciplinary core literacy.

Table 1 Faculty and student learning activity exchange table

Teaching content	Basic Questions	Learning Activities
Multiplying fractions by whole numbers	Why fractional multiplication can be converted to whole number multiplication	Multiplication of decimals in stationery stores
The relationship between the number of decimal places in the product and the number of multiplication places	How to determine the position of the decimal point	Have you learned the decimal point?
Approximate value of the product	What is the essence of the "de-tailing method"?	Exchange of Renminbi
Calculators	What is the law of multiplication	Did you learn the calculator?
Estimate	How to estimate	Go to the supermarket today, have you brought enough money?

As shown in Table 1, the learning activeities are problem-centered practical activities that revolve around the learning content. There is a basic problem for each lesson content, and the basic problem corresponds to the learning activity, meanwhile, several small activities can be set under each big activity, which is more vivid.

4.2.5. Implementation of Module Evaluation

Evaluation research is a very complex issue, beyond the affordability of this study, it is impossible to meticulously carry out this work of evaluation methods, but it must be emphasized that evaluation is a guiding role, and it is necessary to emphasize the transformation of evaluation methods to carry out big idea teaching practice, this paper mainly adopts the expressive evaluation method, specifically through two ways:

(1) Teacher-student interaction in the classroom, including the use of sampling methods to ask some students to answer questions.

Table 2 Student Learning Record Form

Learning Record Card				
Item	Standard	Self-evaluation	mutual evaluation	Teacher Comments
Presentation (20 points)	Logical language and clear ideas			
Listening (20 points)	Listen carefully to the views of teachers and classmates and be able to offer their own insights.			
Research (30 points)	Active participation in group activities; ability to use appropriate research methods to draw research conclusions.			
Cooperation (20 points)	Some sense of collaboration; willing to share their research			
Reflection (10 points)	Suggest feasible improvement strategies for research deficiencies.			

(2) As shown in Table 2, the written form of the assignment, in addition to the regular exercises, adds a learning record link that requires students to conduct self-evaluation, student mutual evaluation, and teacher-student evaluation for each chapter they have completed.

5. Research Conclusions

First of all, the basic question of this paper is what is the connotation of big ideas? How to design a basic framework for teaching project learning in elementary school mathematics based on big ideas? The basic idea of answering these two questions in this paper is to analyze the connotation and characteristics of big ideas in mathematics at the compulsory education primary level, so as to provide a basis for what concepts can be called big ideas for the reference of front-line teachers; then, through analyzing the cases of project learning, find the mechanism of realizing and the way of using big ideas in them, combine with the basic design process of project learning, and summarize the basic elements of designing project learning based on big ideas. Finally, according to the above basic elements, the basic teaching framework is designed and a project learning case based on the big idea of "multiplying decimals" is designed.

Secondly, the framework of the big idea-based elementary school mathematics unit teaching design provides a reference way to promote the formation of students' core literacy in mathematics. The framework is based on big ideas, which include: establishing the big idea system, defining the content and objectives of the unit, building a problem system, creating learning activities for teachers and students, and implementing unit assessment. These links work together to provide a mode of thinking that refers directly to the essence of the subject, fully demonstrates the value of the subject, and together promotes students' understanding and transfer.

This paper composes the big ideas of elementary school mathematics in the compulsory education section from the curriculum labeling, refines the core knowledge network under the big ideas, and uses the big ideas as the core knowledge points of the whole project learning, aiming to carry out the process of in-school project learning, in-depth learning of the core concepts, and realize the transfer and integration of knowledge, which can cultivate students' mathematical and core literacy and the ability to solve real-life problems, in line with the elementary school mathematics curriculum basic requirements of teaching and learning.

However, at the same time this brings different degrees of difficulties to frontline teachers' teaching and design as well as students' learning. The shortcomings of the big this current project schools still need to be optimized in research and practice to overcome the difficulties of carrying out, promote the development of project learning and facilitate students' learning of core concepts. The teaching research and design of elementary school mathematics remains a challenge for the current compulsory elementary school level, and project learning based on big ideas will become a powerful form of practice for all scholars and front-line school teachers because of its conceptual clarity and functionality. However, it also has some limitations; there is no one learning style that is suitable for all learning situations, but there is a relatively optimal one. Although the extraction of big ideas is a difficulty in the design of project learning based on big ideas, and the design of driving questions has to be repeatedly considered, it is being optimized through continuous practice, and its educational value cannot be ignored. However, regardless of the form of delivery, the traditional way of receiving learning in classroom teaching should be changed to enhance students' motivation and independent learning ability, which may also be an outstanding advantage of project learning under big idea integration, but there is still room for further development.

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