Development and Research on the Development of Junior High School Mathematical Situation Teaching Materials Based on Chinese Excellent Traditional Culture

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Abstract. China's excellent traditional culture is a precious spiritual wealth for every Chinese, ensuring the continuity and prosperity of the Chinese nation. Integrating excellent Chinese traditional culture into mathematics teaching can not only stimulate students' interest in learning, but also enhance students' cultural confidence and national pride, giving full play to the educational functions of mathematics and traditional culture. Therefore, situational materials based on the excellent traditional Chinese culture are indispensable content in junior high school mathematics teaching. This article explains the idea of developing situational materials based on traditional culture, and based on the development process, some junior high school mathematics situational materials that integrate the excellent traditional Chinese culture are produced.

Keywords: Excellent traditional Chinese culture; junior high school mathematics; situational materials.

1. Introduction

The report of the 18th National Congress of the Communist Party of China proposed cultivating moral character as the fundamental task of education. The "Guidelines for the Incorporation of Excellent Chinese Traditional Culture into Primary and Secondary School Curriculum Curriculum" pointed out that the introduction of traditional culture into primary and secondary school curricula can strengthen the educational function of traditional culture. "Compulsory Education Mathematics" Curriculum Standards (2022 Edition) takes the excellent Chinese traditional culture as a valuable resource and important starting point for implementing the fundamental task of cultivating moral character and cultivating people [1]. The situational teaching materials developed based on traditional culture are to embed abstract mathematical knowledge and the ideas contained in it into carriers related to traditional culture and become materials in mathematics situational teaching.

The research of context material development is mainly concentrated in chemical disciplines, and there are few research on mathematics. Regarding the development of situation material, scholars have done some research around the following aspects.

Professor Liu Chao of Shihezi University in Xinjiang proposes the development model of mathematics and cultural scenarios in Xinjiang ethnic minorities -cultural scenarios +mathematical knowledge models, and lists scenario teaching cases [2].

When the Ye Zihan of Southwest University sorts out the mathematical situation material based on traditional Chinese culture development primary school, it is necessary to grasp the scientific, subjectivity, diversity, reflect the nature of mathematics, and match the principles of mathematics; Digging and selection, processing and presentation of context materials, and the use of context materials [3].

Lin Caiting is based on a great situation teaching in his master's dissertation. By investigating and studying the current status of chemical textbooks and chemical situations of the Luke version, summarizes the principles of the development and utilization of great situation materials, and forms a strategy framework for the selection and use of great situation materials. : Pay attention to the direction of great situation material; attach importance to the integrity and structure of great situation materials; attach importance to the leadership of great situations, and attach importance to
the connection between small situations [4].

Xie Qianyi discussed the theory of the development of primary school physical interdisciplinary situation materials, and constructed a set of development processes for the practical context of junior high school physics interdisciplinary practice, namely digging materials to determine the theme; creating the situation, proposing the main task of the trunk; , Preset drive tasks; compile the data card to provide learning brackets; propose materialization results [5].

Liang Hongwen believes that from the design of situation material to the classroom teaching situation, we must first choose the appropriate situation material according to the teaching goals, and then extract the subject knowledge or concept contained in the situation material, and finally improve the structure of the context material [6].

Research on the development of situational materials is increasing, but there are relatively few studies on the integration of mathematics and excellent traditional Chinese culture. Based on this, this article develops junior high school mathematics scenario teaching materials based on the excellent traditional Chinese culture, summarizes the development ideas, and gives specific cases.

2. Thoughts on the development of junior high school mathematics instruction based on Chinese excellent traditional culture

Combined with the research of scholars, based on the discipline of mathematics, this study believes that the development of mathematical situation materials that integrate into the excellent traditional culture of China mainly include four steps. The first step is to select the excellent Chinese traditional cultural context materials; the second step is to process the materials; The third step is to be used in actual teaching; the fourth step is to reflect the evaluation.

The excavation material can be carried out through the following three channels: first, sorting out materials related to traditional culture, finding materials related to mathematical knowledge; the other is to study the knowledge of curriculum standards and textbooks. Select the context material according to teaching goals. It is found that the material culture and non-material culture contained in traditional culture through consulting the literature.

On the basis of the selected situation of the situation, combine the material with the corresponding mathematical knowledge, and refer to the in-depth processing of the target and requirements of the knowledge of the curriculum. This step needs to analyze the mathematical elements contained in the material, and the relationship between mathematical knowledge and mathematical thoughts, which can play a role in the teaching process, as well as checking materials related to material, fully understand the material background, integrate the material to integrate mathematics into mathematics Prepare in teaching, so this process should be carefully studied and repeatedly scrutinized.

Next, incorporate the developed situation material into specific mathematical teaching. This step requires the design of context materials into a teaching situation that can be used in mathematics teaching, which is a practical problem. In teaching design, we must first analyze whether it is necessary to join the context material. Although it is currently advocating traditional culture into classrooms, it is necessary to analyze whether it is necessary to analyze according to the actual situation, and then select the appropriate way to join the situation material. Secondly, consider whether the context material is in line with teaching goals, the choice of context material is subject to teaching goals, and it is also conducive to achieving teaching goals. Finally, we must analyze the connection between materials and knowledge, and choose the appropriate method to create context teaching.

After completing the design of context teaching, we must reflect on the context material and evaluation, ensuring that the creation of the situation can promote students' mathematical learning, and it is conducive to the cultivation of the core literacy of students. Generally, it can be evaluated from the following aspects: whether to help students understand mathematical knowledge and concepts; whether to stimulate students 'thinking activities [4]; whether it is based on students'
3. Development practice of junior high school mathematical situation teaching materials based on Chinese excellent traditional culture

3.1 Unexpected situation material material

3.1.1 Selection of unqualified situations

Each firework has a ignition line. The purpose is to run enough time to run into a safe area. In order to ensure the safety of the player, how should the length of the lead be determined?

3.1.2 Processing of unequal situations

Material: It is known that the burning speed of a certain firework fire line is 0.02m/s, and the speed of the player leaves is 4m/s.

There are only conditions about speed in the elemental material, and do not involve time and distance. If relevant conditions are given, the length range of the lead can be calculated based on the speed, distance, and time formula.

3.1.3 The presentation of the situation

Question: Fireworks and firecrackers have a history of more than 2,300 years in my country. Fireworks and firecrackers have concentrated the wisdom of the working people in my country in the history of thousands of years, exerted their unique functions, and formed a unique cultural connotation. Chinese ethnic groups have the custom of setting up fireworks and firecrackers in major festivals. The genes that carry the traditional culture of the Chinese nation are the historical memories of the Chinese nation for thousands of years, a cultural symbol, and an intangible cultural heritage. When placing a certain kind of fireworks, in order to ensure safety, the player must be transferred to a safe area of 10 meters away before the fire leads. It is known that the burning speed of the fire line is 0.02m/s, and the speed of the player leaves is 4m/s. So what conditions should the length of the ignition line be met?

References
[6] Liang Hongwen, Wu Yanjie, Huang Danqing. From context material to design of chemical teaching based on real situations-take the "industrial nitric acid" situation as an example [J]. Chemical teaching, 2019 (09): 56-60.