

The Integration of Chinese Excellent Traditional Culture into Primary School Mathematics Curriculum Dilemmas, Values, and Strategies

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Abstract: The People's Education Press (PEP) elementary mathematics textbooks contain abundant elements of traditional Chinese culture. Integrating these elements into elementary mathematics curriculum teaching aligns with the educational demands of the new era. However, several challenges currently hinder this integration: low overall emphasis, insufficient teacher capability, deviations in teaching philosophy, and disconnection from practical teaching. Despite these challenges, the value of integrating traditional Chinese culture into elementary mathematics curriculum teaching is significant. It helps cultivate students' patriotism and enhance cultural identity, promotes comprehensive student development, establishes a foundation for cultural confidence, broadens the cultural perspective of mathematics, enriches pathways for promoting traditional culture, and deeply excavates the traditional cultural elements in mathematics textbooks to improve the quality of mathematics education. To achieve these goals, corresponding strategies should be adopted, including emphasizing traditional culture with a focus on moral education, improving teacher quality to highlight cultural value, updating educational concepts to innovate integration methods, and implementing a "people-oriented" approach closely linked to practical teaching.

1. Introduction

In October 2017, the report of the 19th CPC National Congress further emphasized that "adhere to creative transformation and innovative development, and constantly create new glory of Chinese culture [1]." It has become a common understanding that Chinese culture should be creatively integrated into the primary school mathematics curriculum so that the traditional culture can bring out the expected educational effect. The fine traditional Chinese culture refers to the sum total of spiritual achievements created and preserved by the Chinese nation, which concentrate on the core spirit and pursuit of the Chinese nation, and play a positive role in the development of The Times. Under the background of core literacy, students are required to inherit and carry forward the excellent traditional Chinese culture, and take bacon as the soul and culture education as the main theme of teaching [2]. In recent years, the excellent traditional Chinese culture has been emphasized by the Party and the state to inherit and develop it, and a series of relevant policies and documents

have been issued to carry out the implementation in the basic education curriculum and enrich the theoretical research on the inheritance of traditional culture. In April 2022, the Compulsory Education Mathematics Curriculum Standards (2022 edition) was promulgated [3]. Among them, it is repeatedly mentioned that the content of mathematics curriculum should organically integrate with traditional culture in combination with the characteristics of mathematics disciplines and the laws of students' cognitive development, and take cultural education as an invisible path to cultivate morality and cultivate people. The excellent traditional Chinese culture is clearly mentioned in it, and the following improvements are made in some aspects: In the part of the curriculum concept, the inheritance and development of the excellent traditional Chinese culture as one of the principles of course content selection; In the content part of the course, it puts forward specific requirements for the implementation of traditional culture; In the implementation part of the curriculum, it puts forward how to implement traditional culture. On the basis of the Guide, the 2022 edition of the Compulsory Curriculum takes moral cultivation as the fundamental task, emphasizing the integration of traditional culture into the basic education stage, so that students can deeply feel the powerful charm of traditional culture.

2. Challenges of Integrating Outstanding Traditional Chinese Culture into Primary School Mathematics

(a) Insufficient Emphasis on Integration

Despite efforts to promote outstanding traditional Chinese culture, the results have been less than significant. In today's society, various stakeholders, including teachers, parents, and students, do not prioritize traditional culture sufficiently. The entrenched "score-only" mentality still dominates, where test scores are the sole measure of a student's overall quality. High scores are equated with being a good student, while low scores label one as a poor student, neglecting the integration of traditional culture. This results in students receiving rote education without drawing strength from cultural values, leading to skewed value systems. On a societal level, there is a need for further refinement of national policies to better promote and inherit traditional Chinese culture. From a teacher's perspective, there is a misconception that integrating traditional culture is unimportant, leading to its neglect in teaching. Moreover, the rigid, didactic approach of teachers in integrating traditional culture proves ineffective. Parents often believe that cultural education does not enhance academic performance, fostering the erroneous notion that traditional culture is "useless." This belief persists because they see no direct link between cultural knowledge and academic achievement. Consequently, students are not exposed to this knowledge in class or outside of it, leaving them unfamiliar with it. This societal trend of diminishing respect for traditional culture requires collective efforts to correct. Changing this phenomenon is not an overnight task but one that requires persistent efforts to overcome each challenge, integrating traditional Chinese culture into the entire educational process. This approach can breathe new life into traditional culture in the modern era.

(b) Insufficient Teacher Capability

The effectiveness of integrating traditional Chinese culture into primary school mathematics is closely tied to the teachers' capabilities. A teacher's proficiency significantly impacts students' reception of traditional culture. Currently, most teachers lack awareness of the traditional cultural elements in primary mathematics textbooks and have a superficial grasp of traditional culture. They fail to effectively incorporate cultural elements into their lessons, often resorting to mechanical, rigid teaching methods that scatter content and lack depth. Teachers' teaching methods are predominantly lecture-based, lacking variety and failing to deeply explore the cultural content in textbooks. They also miss opportunities to utilize extracurricular resources, limiting their cultural

perspective and hindering integration. The current state of primary school mathematics teachers' ability to teach traditional culture can be summarized as "lacking, weak, and poor." [4] The traditional cultural content in mathematics textbooks is fragmented and presented in a disorganized manner, lacking a systematic teaching framework. Teachers' reliance on monotonous didactic methods fails to engage students, diminishing their interest in traditional culture. The quality of classroom instruction, particularly the integration of traditional culture, largely depends on the teachers' capabilities. Therefore, improving teachers' personal skills and continuously enhancing the quality of the teaching workforce is crucial. Establishing higher standards for teachers to ensure that those passionate and competent in education take up teaching roles is essential for effective integration.

(c) Misalignment in Educational Philosophy

Integrating outstanding traditional Chinese culture into primary school mathematics aligns with the pace of modern development and is a necessary aspect of contemporary education. However, the educational philosophy directly influences the effectiveness of this integration. Many primary schools face philosophical deviations during the integration process, leading to superficial and shallow incorporation of traditional culture, treated merely as a task to be completed. One major issue is the "borrowed" approach, where schools adopt methods from other schools without creative adaptation, resulting in ineffective integration that fails to highlight the educational value of traditional culture. Another issue is the lack of alignment between different types of traditional culture and the primary school mathematics curriculum. Proper integration requires a deep understanding of the functions and values behind various cultural elements. Rigidly forcing these elements into the curriculum without considering their relevance leads to poor outcomes. Traditional teaching philosophies, deeply rooted in didactic methods, fail to consider students' actual needs and the inherent educational value of traditional culture. The traditional approach of teachers explaining and students listening remains dominant, failing to engage students actively. Updating educational philosophies to align with contemporary needs and guiding teachers in better teaching practices is necessary to foster effective integration.

(d) Disconnect from Practical Teaching

Teaching should be tailored to students' actual circumstances, with targeted and practical instruction. John Dewey emphasized that education should not only impart knowledge but also teach students how to live. However, in practice, teaching often becomes detached from reality. Teachers tend to engage in broad and superficial teaching, using monotonous methods that reduce students' enthusiasm and initiative. The difficulty level of the content makes it hard for students to appreciate the significance and joy of traditional culture, leading to ineffective classrooms. For optimal educational outcomes, teachers and students must cooperate. Teachers' failure to consider students' actual circumstances results in ineffective integration of traditional culture. The lack of engaging methods further diminishes interest and effectiveness. Schools also fail to create a conducive environment for promoting traditional culture, lacking initiatives like cultural seminars or teacher training. Integrating traditional culture into mathematics teaching should be based on students' real-life experiences to ensure better understanding and appreciation [5]. Teachers need to avoid broad and detached teaching, preparing thoroughly to integrate cultural elements meaningfully. A student-centered approach, considering their perspectives and real-life contexts, can maximize the educational value of traditional culture in primary school mathematics.

3. The Value of Integrating Outstanding Traditional Chinese Culture into Primary School Mathematics

(a) Cultivating Students' Patriotism and Enhancing Cultural Identity

Mathematics, a long-standing natural science, has seen significant contributions from Chinese mathematicians throughout history. To effectively integrate traditional culture into the primary school mathematics classroom, teachers can utilize stories of renowned figures in the field of mathematics to make lessons more engaging. This approach helps students appreciate the long history and charm of Chinese mathematics, fostering patriotism and cultural pride[6]. For example, primary school mathematics textbooks contain numerous illustrations that can serve as cultural touchpoints. In the People's Education Press's first-grade textbook, an illustration of astronauts and satellite launches in the lesson "10" can be used to instill pride in the country's space achievements and the perseverance of astronauts. Similarly, the fourth-grade textbook's lesson on "Understanding Large Numbers" features illustrations of various landscapes and population data from different regions of China. Teachers can use these to introduce famous landmarks and cultivate a love for the motherland. Additionally, word problems related to traditional festivals provide opportunities to explain their origins and customs, highlighting the richness of Chinese culture. Textbooks act as a medium for state intentions, societal needs, cultural transmission, and subject content, reflecting the importance of traditional cultural education. As a fundamental subject in compulsory education, mathematics plays a crucial role in preserving and promoting traditional culture. This endeavor is not a thing of the past but an ongoing process.

(b) Promoting Holistic Student Development and Rooting Cultural Confidence

Traditional mathematics teaching has focused primarily on knowledge acquisition and exam scores. Integrating traditional culture into primary school mathematics allows students to reflect on life and deepen their understanding of knowledge. Traditionally, mathematics is viewed as less interesting compared to subjects like literature due to its numerical nature. Integrating traditional culture adds an emotional dimension to mathematics, increasing its appeal and stimulating students' enthusiasm for learning. In the context of the internet, students are easily influenced by foreign cultures, often idolizing them blindly. By incorporating stories of renowned Chinese mathematicians and historical anecdotes into lessons, teachers can foster a sense of national pride and cultural identity. As future builders of the nation, it is imperative to ensure the holistic development of students. Traditional Chinese culture, rich in virtues, helps inculcate good morals and steadfast cultural confidence. Mathematics teaching can nurture students' intellectual development, while traditional culture can enhance moral education. For instance, in the sixth-grade textbook's lesson on "Percentage," the story of Yuan Longping, the "Father of Hybrid Rice," can be used to inspire students. By learning about his dedication and achievements, students can develop a strong sense of virtue and ambition to contribute to the country.

(c) Broadening Mathematical Cultural Perspectives and Expanding Paths for Promoting Traditional Culture

Cultural transmission involves both top-down and bottom-up processes. Promoting culture requires material carriers and effective pathways. Courses are essential carriers of cultural promotion, with teachers and students acting as key transmitters. In primary school mathematics textbooks, traditional culture is often presented explicitly rather than implicitly. Teachers must delve into the cultural meanings embedded in the content to effectively integrate traditional culture into mathematics lessons. This approach broadens students' cultural perspectives in mathematics and stimulates their mathematical thinking[7]. Teachers should not limit themselves to textbook content but utilize online resources and extracurricular readings to connect traditional culture with mathematics. The influx of foreign cultures has negatively impacted traditional Chinese culture. Younger students, still immature in various aspects, are particularly susceptible to external influences, including misleading information on the internet. Teachers must guide students in filtering useful information from the internet to maintain their cultural identity. Promoting traditional culture involves diverse pathways. The development of society offers students multiple sources for

understanding culture, such as the internet, classroom learning, and oral traditions. Teachers should leverage these avenues to integrate traditional culture into mathematics, ensuring students gain a comprehensive understanding beyond textbooks.

(d) Enhancing Educational Quality by Exploring Traditional Cultural Elements in Mathematics Textbooks

When guiding students in learning mathematics, teachers should incorporate diverse traditional cultural perspectives to enrich students' cultural thoughts and enhance their cultural pride. To improve the educational quality of mathematics courses, it is essential to thoroughly explore the traditional cultural elements in textbooks. For instance, the story of Zu Chongzhi, an ancient Chinese mathematician and astronomer who precisely calculated the value of π , can be integrated into the sixth-grade lesson on "Circumference of a Circle." By learning about Zu Chongzhi's perseverance and contributions[8], students can be inspired and cultivate a sense of character. In the first-grade lesson "Understanding the Clock," teachers can use a PPT to showcase various timekeeping tools like stopwatches and hourglasses, providing historical context[9]. The fourth-grade lesson on "Understanding Calculation Tools" contains many elements of abacus culture, which can be used to deepen students' understanding and interest in traditional calculating methods. By breaking the stereotype of traditional culture being absent from mathematics classrooms, teachers can enrich lessons and create a more engaging learning environment. Traditional culture infuses new vitality into mathematics education, laying a solid foundation for improving the educational quality of mathematics courses through the effective integration of cultural elements.

4. Strategies for Integrating Outstanding Traditional Chinese Culture into Primary School Mathematics

(a) Emphasizing Traditional Culture with a Focus on Moral Education

The importance of traditional culture is undeniable. It requires a collective effort from the state, society, schools, teachers, and parents to integrate traditional culture into various aspects of students' lives and development. Mathematics, as a foundational pillar of human intellect, plays a significant role in preserving and promoting outstanding traditional Chinese culture[10]. Teachers should draw upon the essence of traditional culture and organically blend it into primary school mathematics instruction. By setting an example and imparting traditional culture to students, teachers enable students to firmly grasp mathematical knowledge while deeply understanding the cultural heritage's spiritual essence. In addition to teaching academic content, primary school mathematics should incorporate moral education through traditional culture. This is especially crucial for primary school students, whose values and worldviews are still forming. Teachers should seize this critical development period to instill good moral values. The concept of "cultivating virtue and nurturing people" should be prioritized in education, as virtue forms the foundation of personal development. Without virtue, even the most talented individuals can pose significant risks to society. Thus, teachers must keep the mission of promoting traditional culture at the forefront, embedding moral education throughout the teaching process. They should not only be conveyors of knowledge but also guides in moral development. Currently, the focus on traditional culture needs to be intensified to ensure its brilliance continues to shine throughout history.

(b) Enhancing Teacher Quality to Highlight Cultural Value

Teachers must continually enrich themselves to keep pace with modern developments, improving their teaching skills and professional capabilities. They should adopt advanced teaching methods and expand their knowledge to broaden their educational perspectives. The cultural literacy of teachers is not innate but acquired through continuous learning and exploration. Therefore, primary

school mathematics teachers should stay abreast of developments in traditional Chinese culture, drawing insights from it. Teachers should not only study mathematics textbooks to uncover their rich traditional cultural resources but also deeply understand the curriculum standards and educational philosophy. Reading professional books related to traditional culture can further enrich their knowledge base, enabling them to build a robust framework for integrating traditional culture into mathematics teaching. Schools should address the current weak awareness of traditional culture among mathematics teachers by organizing various training sessions to foster growth. Schools can invite experts in traditional culture education to conduct seminars, transforming teachers' educational perspectives and enhancing their cultural awareness. Workshops and teacher salons on traditional culture can facilitate the exchange of experiences and methods, further developing teachers' cultural literacy. Additionally, research on traditional mathematics culture can promote teaching, increasing teachers' awareness of cultural integration. The value of traditional culture is immense, and teachers play a crucial role in realizing this value through self-improvement and external learning opportunities.

(c) Updating Educational Philosophies and Reshaping Integration Methods

Incorporating outstanding traditional Chinese culture into primary school mathematics is a vital step in enhancing cultural education. Teachers must update their educational philosophies and move away from mechanical integration methods. Some teachers still adhere to rigid teaching approaches without considering students' actual circumstances. It is essential to adopt innovative integration methods, starting by emphasizing school-based features to creatively integrate traditional culture. To achieve effective integration, schools should strengthen their cultural construction and highlight their unique characteristics. Given the vast and varied nature of Chinese culture, teachers should exercise educational wisdom to select the most suitable cultural types for students. Utilizing information technology can enhance the integration process. The development of the internet offers new opportunities for promoting traditional culture. Teachers can use multimedia and online tools to make traditional culture's essence and value more accessible and engaging for students. Integration methods significantly impact students' reception of traditional culture. As the implementers of classroom teaching, teachers should employ diverse and multidimensional integration approaches. Enhancing teachers' capabilities in cultural integration is crucial. Schools can organize training sessions, where teachers are given ample time to reflect on how to integrate traditional culture into mathematics lessons. Expert evaluations and feedback can guide teachers in refining their methods.

(d) Implementing a "People-Oriented" Approach and Connecting with Real Life

Chinese history reveals a rich and diverse traditional culture, often serving as a guide for societal development. Teachers should highlight the cultural elements and values inherent in daily life, sparking students' interest in mathematics and boosting their enthusiasm for learning. Primary school students, who rely more on concrete thinking, find abstract mathematical concepts challenging. Integrating traditional culture effectively requires teachers to consider students' perspectives and connect lessons to their daily experiences, making cultural knowledge more relatable and easier to absorb. Teachers should thoroughly understand students' developmental levels and capacities, tailoring their teaching strategies accordingly to achieve optimal educational outcomes. By grounding lessons in students' everyday experiences, teachers can make content more accessible and engaging. Emphasizing a "people-oriented" approach throughout the teaching process ensures that students' perspectives and real-life contexts are at the forefront, making lessons more comprehensible and effective.

5. Conclusion

Integrating outstanding traditional Chinese culture into primary school mathematics is of great

significance. This study, recognizing the urgency of this integration, has analyzed the challenges, value, and strategies involved through literature review methods. The entrenched "score-only" mentality has negatively impacted this integration, slowing its progress. Therefore, it is imperative for the state, society, schools, parents, and students to create a supportive platform for this integration, fostering a conducive environment for the development of traditional culture. Primary school mathematics, by stimulating and restructuring students' thinking, broadens their cognitive horizons and deepens their intellectual patterns. With the rise of quality education concepts, there is increasing emphasis on the role of traditional culture in education. Teachers must contemplate how best to integrate traditional culture into mathematics lessons, enriching students' cultural knowledge and firmly establishing cultural values. This silent but profound educational process aims to cultivate students' lifelong learning abilities, social adaptability, and the capacity to form correct worldviews, life views, and values, while nurturing noble morals and strong psychological resilience.

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