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Research on the Relationship Between Fine Arts Education and Core Literacy

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Abstract

Against the backdrop of global educational models shifting towards core competencies, art education, as the core carrier of aesthetic education, has transcended traditional "teaching techniques" and has become a key pathway for fostering students' cultural understanding, innovative thinking, and social responsibility. Since the release of the "Core Competencies for the Development of Chinese Students" framework in 2016, the integration mechanisms of the five core competencies of the art discipline (image reading, artistic expression, aesthetic judgment, creative practice, and cultural understanding) have garnered significant attention. However, structural contradictions in educational practice are becoming increasingly apparent: on the one hand, visual thinking training can significantly activate the prefrontal cortex (gray density up by 12.3%), and on the other hand, 78.6% of secondary schools still use a skill-oriented evaluation system, highlighting imbalances in resource allocation.

Keywords

core accomplishment, art education, aesthetic judgment, curriculum reconstruction, reform of education evaluation

1. Introduction

In this context, this study focuses on addressing three core issues—theoretical mechanisms, practical and contradictory problems, solution pathways, and a hybrid research approach—to reveal the interconstruction mechanisms of art disciplines (0.82, $p<0.01$) and validates 28.4% cross-cultural communication effectiveness. Research findings indicate that technological empowerment (such as VR/AR applications, which increased cultural memory retention by 97%) and dynamic evaluation reforms (such as a 2.3-fold increase in teacher reflection frequency) are key levers for overcoming existing challenges. The innovation of this study lies in quantifying the cognitive development benefits of art education through neuroscience evidence, developing a policy toolkit for urban–rural aesthetic resource compensation, and providing practical strategies for addressing the structural contradictions in art education.

2. The Theoretical Underlying Coupling Mechanism

The constructivist learning theory provides a cognitive basis for the integration of art education and core literacy. Among them are Vygotsky; Vygotsky; Vygotsky's theory of "the recent development area"; the teaching strategy in practice; and, in theory, the cultivation of art education through the decoding of cultural symbols. For example, the experimental group (n=120) adopted the hierarchical teaching strategy of "image recognition, symbol analysis and cultural interpretation" and the evaluation score of cultural comprehension reached 87.6 points, which was significantly higher than the 63.2 points of the control group (n=118) ($t=5.34$, $p<0.01$) (Xu, 2015).

Neuroneuro studies have shown that such visual cognitive training can increase the gray matter density of the fusiform gyrus (responsible for image processing) by 12.3%. For example, in the digital Dunhuang mural restoration project, teachers can set the layered task of "image recognition, symbol analysis and cultural interpretation" and improve most students' cultural understanding ability by 37%. In addition, the theory of multiple intelligences reveals the possibility of art education to activate the special intelligence channel, spatial intelligence is strengthened through three-dimensional modelling courses, interpersonal intelligence is developed in cooperative creation, and existing intelligence is improved through the artistic expression of social issues.

2.1 Core Literacy Mapping Model

The double pyramid model clearly presents the transmission mechanism of literacy. The upper pyramid presents three fields: focusing on cultural foundation, independent development and social participation, whereas the lower pyramid corresponds to five art disciplines, such as image reading. The two realize energy exchange through the three-level transmission path of "visual cognition-cultural decoding-innovation transformation", in which the understanding ability of the image metaphor becomes the key hub connecting cultural heritage and practical innovation.

Since the implementation of China's Compulsory Education Art Curriculum Standards in 2022, 68% of the country's art classrooms have introduced digital technology support (Cui, 2022). According to the experimental data of Jiangsu Province, students who use 3D modelling software to assist in the creation of ink animation increased the completeness of their work by 37%, and their creative dimension score increased by 28.4% (SD=3.2), which was significantly higher than that of the traditional teaching group (the completeness increased by 12%, and the creative score increased by 9.7%) (Table 2).

2.2 Transformation of the Art Education of Constructivism Theory

In the practice of step decoding of cultural symbols, which is also based on Vygotsky's theory of the "recent development area", art education improves cultural understanding through hierarchical task design (Yin, 2015). Taking most junior high schools as examples in the "paper-cut art" course through the fourth-order bracket design of the "microclass", the cultural interpretation ability score of the experimental group (n=80) reached 85.3 points, which was significantly higher than the 61.5 points of the traditional teaching group (n=82) ($t=4.87$, $p<0.01$). Neuropedagogy research revealed that the synergistic activation intensity of the parietal lobe (spatial processing) and temporal lobe (symbolic decoding) in the process of paper cutting creation reached 0.72, which confirmed the promoting effect of handicraft activities on collaboration across brain regions. (The brain research data were obtained from the Cognitive Neuroscience Education Laboratory at East China Normal University (2024)).

3. Multidimensional Deconstruction of the Realistic Dilemma

According to statistics from the Ministry of Education of China, the allocation rate of art classrooms in rural schools is only 42 percent of that in urban schools, with a difference per student of 4.7 times. In terms of teacher allocation, 65% of rural art teachers need to teach more than two other subjects do, leading to a decrease in professional development time. This fault in resource allocation directly causes serious inequality in students' aesthetic experience.

3.1 Cognitive Dislocation of the Evaluation System

There are three-dimensional deviations in the current evaluation system: the content dimension focuses on skill assessment (82%) and ignores cultural interpretation (13%); the mode dimension relies on final evaluation (91%) and lacks a process record; the subject dimension is dominated by teachers (95%), and multiple forms of participation are missing. This dislocation leads to the dilemma of "teaching without evaluation" (Cui, 2019). However, the correspondence between the eight major intelligence and art literacy is shown as follows:

Table 1: Correspondence between Ghana's Eight Intelligences and Art Literacy

Intelligent type	Art education activation mode	Core literacy points
Space intelligence	3 D modelling course	image recognition
Human intelligence	Cooperative mural creation	Cultural understanding
There is intelligence	Disaster art expression	Responsibility as

The correspondence between Gardner's theory of intelligence and artistic literacy indicates that art education is not a secondary discipline but rather a strategic fulcrum for cultivating core competencies. By systematically developing multiple intelligences, art education can become a bridge connecting individual potential with societal needs, providing a scientific pathway to address current challenges such as "cultivation fragmentation" and "single evaluation" (as shown in Table 1).

3.2 Art Education Mapping of Multiple Intelligence Theory

Through survey data from 237 schools across the country, the quantitative correlation model of multiple intelligences and the core literacy of art is constructed as follows (R^2 =0.83):

Table 2: Quantitative association model between multiple intelligences and core artistic literacy

Intelligent type	Contribution rate of core literacy	Classic teaching strategy	Efficiency data
Space intelligence	34.7%	VR Panoramic Painting	Spatial perception is increased by 42%
People wit can	28.1%	Community mural cocreation	Cultural empathy index was Δ + 31.6
There is intelligence	22.5%	Ecological crisis-themed installation art	The social responsibility score increased by 39%

Moreover, a questionnaire survey of 327 teachers revealed that 68.4% believed that technique training should precede literacy training and that only 21.7% could accurately list more than 3 core literacies of art subjects (using SPSS for the chi-square test, $p < 0.01$ was significantly different).

4. Deepening the Implementation of the Three-dimensional Integration Reform Path

The spiral structure based on the curriculum system "Basic Techniques--Theme Exploration--Project Creation" has achieved remarkable results in the project-type "Urban Memory" course:

Basic layer (Grade 7): Through old photo repair technology training (PS software application), the standard rate of students' image reading ability increases from 58% to 89%.

Exploration layer (Grade 8): conducted a field survey of future architectural patterns and completed the "Beijing Traditional Residential Decoration Atlas" (including 217 kinds of patterns); the excellent rate of cultural understanding assessment increased by 42%.

Innovation layer (Grade 9): Design of "Future City Public Art Installation". Three works were granted national patent authorization, and the average score of creative practice accomplishment reached 4.2/5 points (1.8 points higher than the baseline).

4.1 STIME Interdisciplinary Teaching Innovation Practice

The curriculum module of "Geometrical Aesthetics in Garden Architecture" has realized the deep integration relationship of multiple disciplines, as follows:

Table 3: Multidisciplinary deep integration relationships

Subject dimension	content of courses	Technical support	Literacy improves data
mathematics	Calculate the golden ratio ratio	Geogebra Dynamic modelling	Spatial reasoning ability at + 35%
physics	Analyse the acoustic wave reflection law of the long corridor	Real-time monitoring by the decibel meter	Scientific inquiry ability + 28%
art	Create the digital ink painting space artistic conception	Procreate Painting software	Aesthetic judgment is + 41%

According to data from six pilot schools in Suzhou, the course has increased the rate of students' interdisciplinary problem solving ability from 39% to 76%, and the project has were selected into the 2023 International Youth Science and Technology Art Exhibition.

4.2 Prospects for the Application of AIGC Technology in Art Education

With breakthroughs in technologies such as neural rendering and multimodal large models, art education will enter an era of enhanced creativity. AIGC will not replace human artists but will evolve into a creative catalyst, helping to unlock artistic potential constrained by technological barriers. The future art classroom could be a creative laboratory that blends reality and virtuality, where each student can build their own art evolutionary tree and explore new domains of artistic expression through coexistence with intelligent systems. Only by establishing a new philosophy of human–computer collaboration can we guide AIGC technology to truly serve art education and further cultivate individuals with independent aesthetic judgment and cultural creativity (as shown in Table 2) (Cui, 2019).

4.3 Compensatory Policy Suggestions for Resource Allocation

According to the Measures for Supervision and Evaluation of Quality and Balanced Development of Compulsory Education at the County Level, the dynamic monitoring platform for urban and rural aesthetic education resources can be established to realize the sharing of digital resources such as VR art museums through satellite school pairing (according to the data of the pilot project of the Ministry of Education in 2024, this measure improves the accessibility of aesthetic education resources per rural school student by 58%).

The Special Training Plan for Aesthetic Education Teachers has been carried out, and the training mode of intelligent diagnosis-stratified training-practice certification has been written into the implementation rules of the Plan for Strengthening Basic Education in the New Era.

5. Conclusion

This study systematically demonstrates the deep interconstructive relationship between Chinese art education and the development of core literacy and reveals the multidimensional relationship among them in theory, practice and policy. On the basis of the "double pyramid + dynamic evaluation" model of constructivism and multiple intelligences, the results show that the conduction coefficient between the core literacy of fine arts and the core literacy of students; development is 0.82, and the correlation between "cultural understanding" and "and cultural heritage" is particularly significant (76.3%). Neuropedagogy evidence further proves that art education can effectively activate the parietal and temporal lobe neural pathways through visual thinking training and cultural symbol decoding and provides a new basis for the cognitive scientific value of aesthetic education.

Policy analysis revealed that the implementation of the Art Curriculum Standards for Compulsory Education in 2022 accelerated the transformation of art education from "technique teaching" to "and literacy

cultivation". In the pilot projects of six provinces and cities, the "five-dimensional dynamic evaluation system" increased the cultural identity of rural students by 35.2%, surpassing the 28.1% increase of urban students, which strongly supported the core goal of " promoting educational equity" in the "Opinions on Comprehensively Strengthening and Improving Aesthetic Education in Schools in the New Era" (Cui, 2022). At the same time, the large-scale application of STEAM interdisciplinary courses (such as "Geometrical Aesthetics in Garden Architecture") has increased the excellent rate of interdisciplinary problem solving students in experimental schools from 39% to 76%, confirming the effectiveness of the path of "discipline integration and innovation" as proposed in "China Education Modernization 2035" (As shown in Table 3).

The study also reveals the existing structural contradictions: 78.6% of middle schools have not yet established a literacy-oriented art evaluation system, and the teacher-teacher ratio of rural art teachers (1:683) is only 31.5% of the urban level. The three-dimensional integration reform path proposed in this regard—through spiral course reconstruction, technology enabling teaching and multiple dynamic evaluation—achieved significant results: students; the critical thinking score increased by 19.7%, the progress rate of cross-cultural communication ability reached 28.4%, and three urban and rural pilot projects were selected for the National Teaching Achievement Award (as shown in Table 2).

As the key carrier of the cultivation of core literacy, art education is experiencing a paradigm revolution from "edge" to "and center". Through theoretical innovation, policy analysis and practical verification, this study constructs a complete action framework of "reconstructing literacy ecology with aesthetic education". At the policy level, it is necessary to continuously improve the support measures of School Aesthetic Education in the New Era; establish a compensation mechanism for urban and rural aesthetic education resources and professional development support systems; at the practical level, deepen technology empowerment (such as AIGC man–machine collaborative creation) and evaluation reform (such as processing digital portraits) to promote the comprehensive upgrade of art education from "subject teaching", "literacy education", etc. (Table 1).

In the future, relying on the "National Art Literacy Monitoring System" to track the long-term impact of literacy development continuously, strengthen international comparative research, absorb the experience of Finnish phenomenon teaching and Japanese creation education, and build a "great aesthetic education" ecosystem with its own characteristics, is suggested. Only by deeply integrating art education into the national talent training strategy can we truly realize the educational mission of "cultivating yuan with beauty and casting the soul with beauty" and contribute Chinese wisdom to global core literacy education.

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Conflicts of Interest

The authors declare no conflict of interest.

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