

Innovative Design and Educational Practice of Shu Embroidery Fans in Higher Art Education

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ABSTRACT

Against the backdrop of global cultural inheritance and modern art education reform, Shu embroidery, a representative intangible cultural heritage of Sichuan, faces dilemmas including insufficient creative transformation, disjointed talent training, and limited interdisciplinary integration in university art teaching. This study adopts a standardized mixed quantitative and qualitative research methodology, combining literature analysis, field investigation, project-based teaching practice and empirical data statistics, to explore systematic innovative design strategies and sustainable educational application modes of Shu embroidery fan works in higher art courses. It sorts out traditional artistic features, pattern semantics and craft procedures of Shu embroidery fans, and constructs a multi-stage progressive teaching system integrating traditional inheritance, digital design and independent creation. Practical effects are verified through student work evaluation, ability assessment and classroom feedback. The results prove that cross-border innovation and project-driven practice can effectively promote the living inheritance of Shu embroidery, optimize art curriculum structure, and enhance students' traditional cultural literacy and modern design innovation ability.

Keywords: Shu Embroidery Fan; Higher Art Education; Innovative Design; Educational Practice; Intangible Cultural Heritage Inheritance

INTRODUCTION

Shu embroidery, one of China's four famous traditional embroidery crafts, carries profound Bashu aesthetic culture, exquisite needlework and distinctive cultural implications, and has been included in the national intangible cultural heritage protection catalogue (Wang & Li, 2024). As an integrated artistic carrier combining embroidery craftsmanship, fan shape and decorative aesthetics, Shu embroidery fans possess outstanding ornamental, cultural symbolic and design application value. Under the background of cultural globalization and digital art iteration, traditional Shu embroidery is gradually marginalized in contemporary art education: the conventional master-apprentice inheritance mode cannot adapt to diversified talent demands, and innovative design of Shu embroidery fans lacks complete theoretical support and standardized teaching paths (Zhang et al., 2025).

Existing academic studies on Shu embroidery mainly focus on craft protection, historical sorting and digital preservation, but few connect Shu embroidery fan innovation with university art curriculum construction, lacking systematic methodologies, quantitative effect verification and long-term teaching operation modes (Chen & Liu, 2023). Higher art education undertakes the mission of cultural inheritance, artistic innovation and talent output. Introducing Shu embroidery fan innovative design into professional courses, optimizing teaching links and constructing integrated practice systems can realize the creative transformation of intangible cultural heritage, enrich art curriculum content, and improve students' comprehensive artistic accomplishment (Yang & Huang, 2026).

This research takes Shu embroidery fan design and teaching practice as the core, clarifies its artistic characteristics and inheritance status, formulates rigorous research methodology, explores curriculum practice and innovative paths, summarizes existing problems, and puts forward optimization strategies, providing practical references for integrating traditional Chinese crafts with modern higher art education.

LITERATURE REVIEW

Inheritance and Development Status of Shu Embroidery Art

Post-2023 studies show that Shu embroidery has distinctive artistic features, including delicate stitches, natural color transitions, vivid patterns and flexible lines, forming a unique aesthetic style different from other famous embroideries (He & Zhou, 2024). Driven by national intangible cultural heritage policies, Shu embroidery has gradually entered campus education, but current inheritance still faces bottlenecks: aging inheritors, shortage of young talents, single product forms, insufficient integration of modern design, and disconnection between craft inheritance and art education (Li & Zhao, 2023).

Digital technologies such as AIGC and VR have been applied to Shu embroidery pattern extraction and craft simulation, expanding its innovative expression scope. However, the combination of digital technology and fan design is still in the preliminary stage, with no mature teaching specifications in higher education (Wu & Tan, 2025). As a lightweight and practical carrier, Shu embroidery fans are suitable for classroom practice and student creation, with inherent advantages in popularizing Shu embroidery culture (Xiong & Wang, 2024).

Integration of Intangible Cultural Heritage and Higher Art Education

International academic circles recognize that traditional folk craft education is an important part of modern aesthetic education, and interdisciplinary teaching can improve art majors' comprehensive literacy (Smith & Brown, 2024). Domestic research points out that integrating intangible cultural heritage into university art courses helps shape cultural confidence, expand aesthetic cognition, and break the Western-centered teaching limitation (Liu & Chen, 2025). Project-based, workshop-style and master-apprentice collaborative teaching have become mainstream modes, combining theoretical learning, technical practice and artistic creation (Fan & Yu, 2023).

Existing studies mostly focus on general embroidery crafts, lacking targeted exploration on Shu embroidery fan innovative design. They also suffer from insufficient quantitative analysis of teaching effects, incomplete curriculum systems, and inadequate discussion on long-term inheritance mechanisms (Gao & Shi, 2026). This study focuses on Shu embroidery fans, constructs targeted design and practice systems, and fills the gaps in current research.

Innovative Design of Traditional Fan Art

Traditional Chinese fan art has abundant shapes, patterns and aesthetic connotations, widely studied in cultural archaeology and design fields. Modern fan design integrates fashion, digital aesthetics and practical functions, transforming from daily utensils to cultural and creative works (Han & Zhang, 2023). However, matching Shu embroidery stitches with fan shapes is challenging, requiring coordinated material selection, pattern layout and craft implementation, and there is a lack of systematic design strategies and teaching guidance (Zheng & Li, 2025). This study explores diversified innovative paths, forming operable methods for university students.

METHODOLOGY

This research adopts a mixed quantitative and qualitative empirical methodology, complying with international academic standards, including four core links: literature research, field investigation, curriculum action research and comparative statistical analysis. The research process is scientific, rigorous and reproducible, ensuring the authenticity and reliability of results.

Literature Research Method

The author collected domestic and international papers, monographs, policy documents and industrial materials related to Shu embroidery, fan design, art education reform and intangible cultural heritage inheritance from 2023 to 2026. Through keyword retrieval and content induction, it sorted out the historical evolution, artistic characteristics, inheritance dilemmas and educational application of Shu embroidery fans, summarized research gaps, clarified research objectives, and laid a theoretical foundation for subsequent practice (Wang et al., 2024).

Field Investigation Method

On-site investigations were conducted at Shu embroidery inheritance bases, craft museums, intangible cultural heritage workshops and art colleges. Interviews were held with national/provincial inheritors, senior artists, professional teachers and outstanding students, recording traditional production technologies, pattern systems and creation experience of Shu embroidery fans. A large number of physical works and process images were collected, sorting out practical problems in integrating traditional fans with university teaching (Sun & Ma, 2025).

Curriculum Action Research Method

Taking 82 sophomore art design students from a provincial university as samples, a full-semester Shu embroidery fan innovative design course was carried out. The course was divided into four progressive stages: theoretical cognition, craft skill training, innovative design, and work creation & evaluation. Teachers adopted PBL project-driven teaching, combining master-apprentice guidance and group cooperation, tracking students' practice, adjusting teaching strategies in a cycle of practice-summary-improvement (Zhou & Wu, 2024).

Comparative Statistical Analysis Method

A multi-dimensional evaluation index system was constructed, including theoretical mastery, craft ability, innovative design, aesthetic expression and curriculum satisfaction. Pre-test and post-test data of students' abilities were collected, and work quality evaluation results were sorted out. Descriptive statistics and difference analysis were used to quantify teaching effects, compare traditional and innovative teaching modes, and form data-supported conclusions (Lin & Xie, 2023).

Research Objects and Scope

The research objects were 82 sophomore art design students (41 males, 41 females) with basic design foundations but no systematic Shu embroidery learning experience. The research scope included pattern innovation, shape optimization, material reform, curriculum construction and teaching effect evaluation, with a 16-week research cycle to ensure sufficient samples and data.

Characteristics and Innovative Dimensions of Shu Embroidery Fans

Traditional Artistic Characteristics

Shu embroidery fans integrate Bashu culture, embroidery craft and fan aesthetics. They adopt more than 30 classic stitches such as flat stitch and rolling stitch, featuring smooth lines and delicate layers (Tang & Peng, 2025). Traditional patterns mainly include flowers, birds, landscapes and auspicious symbols, with profound cultural implications. The main shapes are round fans, folding fans and palace fans, matching silk, satin, bamboo and wood materials, forming an elegant style consistent with higher art education aesthetics.

Innovative Design Dimensions

Combined with contemporary art education and aesthetic demands, modern Shu embroidery fan innovative design is divided into four core dimensions, as shown in Table 1.

Table 1 Four Core Innovative Design Dimensions of Modern Shu Embroidery Fans

Innovative Dimension	Specific Content	Design Characteristics	Educational Value
Pattern Innovation Cultural	Deconstruct traditional patterns, integrate modern graphics, simplify Shu embroidery symbols	Strong symbolism, fashionable visual expression	Cultivate pattern analysis and creative recombination ability
Shape Innovation Structure	Optimize fan contours, innovate folding and combined shapes	Diversified structures, ornamental and practical	Exercise spatial modeling and structural design thinking
Material Innovation Process	Combine traditional silk with eco-friendly fabrics, optimize embroidery processes	Green lightweight, low learning difficulty	Improve practical operation and material cognition
Digital Innovation Cross-border	AIGC pattern generation, VR craft simulation, digital rendering	Intelligent auxiliary design, efficient creation	Cultivate interdisciplinary digital integration ability

Note: This table clarifies four innovative directions of Shu embroidery fans, including specific content, characteristics and educational value. The four dimensions complement each other, retaining traditional Shu embroidery authenticity while adapting to college students' creative habits, providing clear guidance for classroom teaching.

Construction of Educational Practice System

Combined with research methodology and curriculum practice, a four-stage progressive teaching system was constructed, realizing a closed-loop from theoretical input to achievement output. Specific stages are shown in Table 2.

Table 2 Four-Stage Progressive Teaching System of Shu Embroidery Fan Art Course

Teaching Stage	Duration (Weeks)	Core Teaching Content	Key Ability Training	Teaching Mode
Theoretical Cognitive Stage	1-3	Shu embroidery history, fan culture, pattern semantics, inheritance policies	Cultural cognition, aesthetic judgment	Lectures + audio-visual appreciation + inheritor lectures
Traditional Skill Stage	4-7	Basic stitches, material processing, embroidery operation	Craft operation, hand coordination	Demonstration + hands-on practice + one-to-one guidance
Innovative Design Stage	8-12	Pattern reconstruction, shape optimization, digital design	Innovative thinking, cross-field integration	PBL teaching + group discussion + digital practice
Work Output & Evaluation Stage	13-16	Comprehensive creation, exhibition, multi-dimensional evaluation	Integrated application, aesthetic expression	Work defense + peer evaluation + teacher scoring

Note: The system follows students' cognitive and skill learning laws, with clear objectives and diversified teaching modes. It combines traditional inheritance and modern innovation, adapting to higher art education curriculum standards and ensuring orderly practice.

Theoretical Cognitive Link

Teachers explained Shu embroidery’s history, cultural connotations and aesthetic characteristics, organized students to appreciate classic works and watch craft videos, and invited inheritors to give lectures. Students mastered basic aesthetic rules and pattern knowledge, laying a theoretical foundation for subsequent practice (Yu & Lin, 2024). Teachers also analyzed inheritance dilemmas, guiding students to explore integration paths of traditional culture and modern education.

Traditional Craft Skill Practice

Focusing on practical teaching, teachers demonstrated core stitches and fan embroidery processes, guiding students to practice step by step. Complex stitches were appropriately simplified to reduce learning threshold, ensuring students could complete basic operations within classroom hours (Peng & Tang, 2025). Small-class intensive teaching and one-to-one guidance improved students’ manual operation level.

Innovative Design and Scheme Creation

With project tasks as the core, students carried out group-based innovative design, deconstructing patterns, optimizing shapes and using digital technologies. AIGC generated diversified pattern schemes, and VR simulated embroidery effects, enriching expression forms and cultivating interdisciplinary ability (Liu & Wu, 2026). Each group completed design drawings and schemes, which were revised through discussion.

Work Completion and Multi-dimensional Evaluation

Students integrated theory, skills and innovation to complete high-quality works. A comprehensive evaluation system was established, combining process and result evaluation, teacher and peer evaluation, and inheritor professional evaluation. Excellent works were displayed on and off campus, summarizing teaching problems to optimize subsequent curriculum.

Analysis of Educational Practice Effects

Students’ Comprehensive Ability Changes

Students’ comprehensive ability scores before and after the course were counted, including four indicators, as shown in Table 3.

Table 3 Comparison of Students’ Comprehensive Ability Scores Before and After Course Practice (Full Score: 100)

Ability Indicator	Pre-course Average Score	Post-course Average Score	Score Improvement Range	Improvement Rate
Shu Embroidery Theoretical Cognition	21.3	82.6	61.3	287.8%
Traditional Embroidery Craft Skills	12.7	75.4	62.7	493.7%
Shu Embroidery Fan Innovative Design	28.5	79.2	50.7	177.9%
Overall Aesthetic Comprehensive Expression	33.1	81.5	48.4	146.2%

Note: Data shows significant improvement in all dimensions of students’ ability. Craft skills improved the most, proving the effectiveness of practical teaching. Innovative design and aesthetic ability also rose greatly, verifying the value of the integrated teaching mode.

Work Quality Evaluation Results

82 groups of works were graded based on artistic integrity, craft standardization, innovation, aesthetic effect and completion, with the results shown in Table 4.

Table 4 Quality Grade Distribution Statistics of Student Shu Embroidery Fan Innovative Works

Work Quality Grade	Quantity of Works	Proportion	Main Characteristics
Excellent Grade	31	37.8%	Standard craft, prominent innovation, high culture-art integration
Good Grade	42	51.2%	Standard technology, reasonable design, good overall effect
Qualified Grade	9	11.0%	Meet craft requirements, moderate innovation, no obvious defects
Unqualified Grade	0	0%	No unqualified works in the practice process

Note: The pass rate reached 100%, and the excellent-good rate exceeded 89%, showing high work quality. Zero unqualified works confirm the teaching system’s suitability for art students, achieving expected practice goals.

Advantages of the Innovative Educational Mode

1. Breaks the traditional master-apprentice inheritance limitation, realizing large-scale standardized talent cultivation of Shu embroidery. 2. Integrates digital technology into teaching, enriching innovation forms and adapting to modern digital art education trends. 3. Combines craft practice and aesthetic design, improving students’ manual ability and creative thinking. 4. Uses fans as lightweight carriers, reducing teaching costs and promoting Shu embroidery popularization in higher education.

Existing Problems and Optimization Strategies

Main Problems

Firstly, the matching degree between part-time inheritor resources and curriculum arrangements is insufficient, limiting long-term on-site guidance. Secondly, individual students have weak manual coordination, leading to uneven learning progress. Thirdly, digital technology integration is not in-depth, and AIGC creation needs better coordination with traditional aesthetics. Fourthly, post-course inheritance mechanisms are imperfect, lacking long-term display and industrial docking channels (Chen & Fan, 2025).

Optimization Strategies

1. Establish school-inheritor collaborative mechanisms, build long-term cooperation with inheritance bases, and arrange regular inheritor teaching. 2. Implement hierarchical teaching, formulate personalized schemes for students with different foundations, narrowing learning gaps. 3. Deepen digital design research, optimize AIGC algorithms matching Shu embroidery, and build a digital pattern resource library. 4. Establish extracurricular Shu embroidery clubs, hold annual exhibitions, connect cultural and creative markets, forming a teaching-practice-display-industry closed loop.

CONCLUSION

This study focuses on Shu embroidery fan innovative design and higher art education practice, adopting a standardized mixed methodology to complete theoretical sorting, field investigation, curriculum practice and data analysis. It clarifies traditional characteristics and innovative dimensions of Shu embroidery fans, constructs

a four-stage progressive teaching system, and verifies significant improvement in students' ability through data and tables.

The results show that introducing Shu embroidery fan design into higher art courses can realize the creative transformation of intangible cultural heritage, enrich curriculum content, and solve the disconnection between traditional craft inheritance and talent cultivation. The combination of traditional craft, modern design and digital technology activates Shu embroidery's living inheritance, cultivating composite art talents with cultural literacy and innovation ability. Targeted optimization strategies are proposed, forming a replicable practice mode.

Future research will expand the sample scope, carry out cross-regional comparative teaching, deepen digital innovation, improve long-term inheritance mechanisms, and promote the integrated development of traditional Chinese crafts and international higher art education.

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