

AIGC-Empowered Teaching Reform and Practice in Cultural Creative Product Design

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Abstract: Against the backdrop of rapid AIGC (AI-Generated Content) technological development and the intelligent transformation of higher education, design education is undergoing profound structural changes. Traditional courses like Ethnic Cultural Creative Design have long been constrained by dilemmas such as “superficial cultural understanding,” “inefficient creative generation,” “lagging technology application,” and “simplified evaluation systems,” making it difficult to meet the cultural and creative industry’s demand for interdisciplinary talent. Based on the latest research in educational technology, higher education pedagogy, and theories of educational change, this paper constructs a three-dimensional “culture-technology-design” integrated curriculum reform framework. It proposes a human-AI collaborative teaching model with AIGC at its core and develops an actionable practical teaching path within real classroom settings. The research indicates that AIGC, serving as a “creative partner,” can significantly enhance students’ depth of cultural decoding, efficiency of idea generation, and quality of technology application. The “dual-mentor guidance + AI collaboration” model facilitates learners’ identity shift from “technology users” to “human-AI co-creative designers.” The construction of a multi-dimensional evaluation system enables systematic assessment of the learning process, cultural value, and degree of technological integration. This reform practice holds significant implications for the paradigm shift in higher education design programs, the sustainable development of culture, and the construction of smart education.

Keywords: AIGC; Teaching Reform; Ethnic Culture; Cultural Creative Product Design; Human-AI Collaboration; Design Education

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1.Introduction

Artificial intelligence-driven technological innovation is profoundly reshaping the global higher education ecosystem (Altbach & de Wit, 2023). Especially against the backdrop of the rapid penetration of generative AI into design practice, the creative industry, and educational settings, the developmental logic of design education is undergoing a structural transformation from “skill-oriented” to “intelligence-collaborative,” and from “product-centric” to “culture-technology integrated” (Selwyn, 2023; Jones & Riedel, 2024). The emergence of AIGC not only changes creative production methods but also reshapes teacher roles, learner identities, and teaching models, offering unprecedented innovative possibilities for art and design education (Noble & Benden, 2023).

However, in cultural and creative courses in Chinese universities, Ethnic Cultural Creative Design, a crucial course

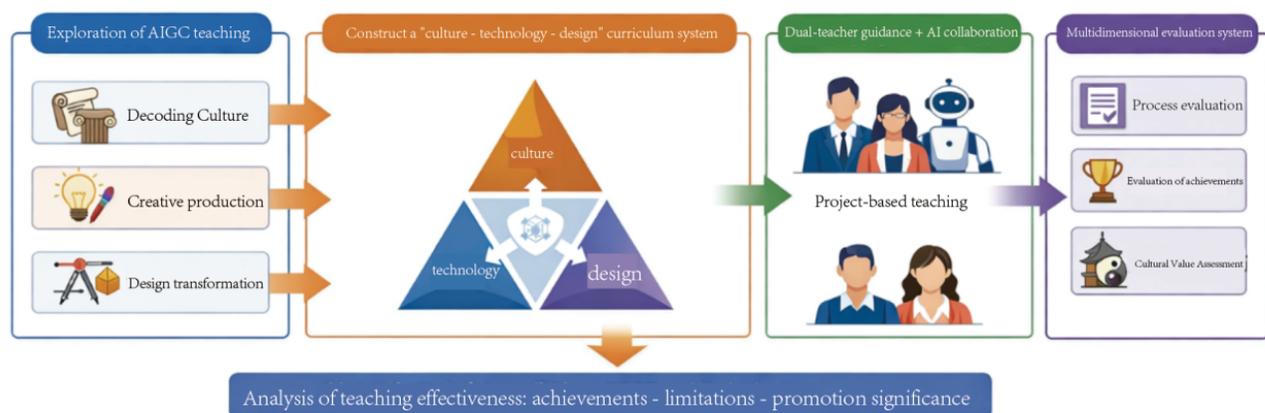
connecting traditional culture with contemporary lifestyles, still faces numerous structural challenges in its teaching. Research finds that students commonly exhibit problems such as superficial cultural understanding, formalistic cultural research, and insufficient innovative capabilities (Zhu Shuai, 2024; Yuan Yue, 2024). The design process's reliance on manual sketching leads to low efficiency in creative iteration (Hu Puyu & Yu Wei, 2025). Technological tools fail to play a role in the early stages of idea generation, showing a clear tendency towards "passive use" (Wang Yanping, 2025). These issues not only constrain teaching quality but also impact the cultural industry's need for interdisciplinary talent with innovative ability and technological literacy.

International educational research points out that technology integration in teaching should not be viewed merely as a tool-based supplement but should trigger structural changes in learning methods and knowledge construction (Laurillard, 2012; Journal of Educational Change, 2022). Particularly in design disciplines, AIGC can act as a "cognitive partner," facilitating learners' cross-modal cognition, rapid creative iteration, and design decision optimization (Davis & Cho, 2023). Furthermore, human-AI collaboration theory posits that the value of AI lies in complementing the designer, allowing cultural expression, aesthetic judgment, and complex creativity to remain human-led, while AI handles generation, deduction, and diffusion tasks (Shneiderman, 2022). This provides a new paradigm for ethnic cultural creative product design education.

Building on this, this paper focuses on real classroom pain points. Based on nearly three years of teaching practice in the Ethnic Cultural Creative Design course, it constructs a curriculum teaching reform framework centered on AIGC empowerment. The research objectives include:

- (1) Exploring the pedagogical value of AIGC in cultural decoding, idea generation, and design transformation.
- (2) Constructing a three-dimensional "culture-technology-design" integrated curriculum system.
- (3) Implementing a "dual-mentor guidance + AI collaboration" project-based teaching model.
- (4) Building a "process-outcome-cultural value" tripartite multi-dimensional evaluation system.
- (5) Analyzing the effectiveness, limitations, and broader implications of the teaching reform.

Figure 1: Innovative Path for Deep Integration of AIGC Technology into Cultural Creative Product Design Teaching



This paper aims to provide a replicable paradigm for teaching reform in cultural and creative courses and to contribute theoretical and practical references for the intelligent, innovative, and culturally sustainable development of design education in universities in the AIGC era.

2. Analysis of Teaching Pain Points in Ethnic Cultural Creative Design Courses

Ethnic Cultural Creative Design courses bear the important mission of cultural inheritance, creative expression, and industrial transformation within the higher education art and design system. However, long-term teaching practice reveals structural and systemic dilemmas. Based on educational reform research (Fullan, 2020), learning sciences (Laurillard, 2012), research on higher education teaching models (Gibbs, 2021), and domestic design education survey data, this study categorizes existing problems into five areas: superficial cultural understanding, low efficiency in idea generation, lagging technology application, weak human-AI interaction awareness, and a singular evaluation mechanism.

2.1 Superficial Cultural Understanding: Superficial Cultural Research, Lack of Cultural Context

Existing research points out that design education often remains at the level of “symbol-based cultural learning,” lacking deep construction of cultural systems, social contexts, and aesthetic traditions (Wang, 2024; Teaching in Higher Education, 2022). In the Ethnic Cultural Creative Design course, students generally only recognize the “explicit features” of culture (such as patterns, totems, colors) but struggle to understand the underlying religious philosophies, collective memory, and ritualistic meanings.

This study’s teaching survey found that over 65% of students could not explain the historical semantics and symbolic logic of the chosen cultural elements. For example, in classroom tasks related to Miao ethnic patterns, many students merely copied silver ornament designs without realizing the protective significance and female identity symbolism of silverware in Miao culture, resulting in design works that are “similar in form but lacking in spirit.”

This phenomenon aligns with domestic research conclusions—current cultural courses in universities exhibit clear signs of “superficial cultural learning” (Zhu Shuai, 2024; Yuan Yue, 2024). International research also indicates that if students fail to engage with the cultural context, cultural and creative courses struggle to produce genuine innovation (Smith & Riedel, 2021).

2.2 Low Efficiency in Idea Generation: Traditional Design Processes Struggle to Support Innovative Iteration

Traditional design teaching processes heavily rely on freehand sketching, step-by-step modification, and linear progression, a model considered an “inefficient creative pathway from the pre-digital era” (British Journal of Educational Technology, 2023). In this course, students took an average of 3–5 weeks to complete a design proposal, with about 70% of that time spent on sketch exploration, repetitive drawing, and visual iteration.

Research indicates that learners in the early creative stage are prone to “blank canvas anxiety,” lacking visual stimuli and cognitive scaffolding (Human–Computer Interaction, 2022). This is particularly prominent in this course: many students exhibited a “don’t know where to start” dilemma during the conceptualization phase, with idea generation significantly dependent on teacher prompts.

International studies show that creative bottlenecks mainly stem from two factors (Jones & Silva, 2023): insufficient external stimuli, and excessively long feedback cycles for ideas. This aligns closely with the actual situation in this course, indicating that traditional methods are ill-suited to the high iteration speed required by the cultural and creative industry.

2.3 Lagging Technology Application: Students View Tools as “Production Tools” Rather Than “Creative Partners”

Although digital software (e.g., PS, AI, Procreate) has become a foundational tool in design learning, students’ use of technology remains confined to “final rendering” and “format processing” stages, showing a clear characteristic of “passive technology use” (Hu Puyu & Yu Wei, 2025).

This study’s questionnaire revealed: 77% of students believed technology was only for “finishing the work”; only 23% of students would actively use digital tools for exploration in the early creative stages.

International research points out that when digital technology is excluded from early cognitive stages, learners’ creative space is significantly compressed (Shneiderman, 2022). Educational technology research also confirms that if technology cannot serve as a “cognitive partner” but only as a post-processing tool, its educational value is greatly diminished (Journal of Educational Change, 2021).

Simultaneously, teachers’ varying abilities in using AIGC further reinforce the negative cycle of “technology lag → limited creativity” (Jing Jiajia, 2025).

2.4 Inflexible Teaching Models: Weak Human-AI Collaboration Awareness, Unidirectional Classroom Interaction

Traditional classrooms emphasize teacher demonstration and student imitation, a model considered inadequate for meeting the needs of “creative learning” in the AIGC era (The Journal of Higher Education, 2023).

Classroom observations in this course showed: interactions between students and teachers were mostly “question-answer”

style; there was a lack of “collaborative creation” and “design debate” among students; AI was not integrated into high-order thinking activities such as classroom discussions, critique, and deduction.

The lack of human-AI collaboration awareness makes it difficult for students to understand AIGC’s role in design, let alone develop “design thinking for the AI era.”

HCI research indicates that learners need to co-construct meaning and make joint decisions with AI in complex situations to truly enter an “AI-augmented learning mode” (Lee & Suh, 2023). The current pedagogy in this course clearly falls short of this direction.

2.5 Singular Evaluation Mechanism: Neglecting the Balance Between Cultural Depth, Process, and Technology

Current course evaluation primarily focuses on students’ final design products. This “product-centric” evaluation approach has been criticized by numerous educational studies as detrimental to competency development in cultural courses (Gibbs, 2021).

Deficiencies in evaluation include: neglecting the depth of cultural understanding (lack of cultural context explanation); overlooking design thinking and the idea generation process; lacking evaluation dimensions for AIGC application ethics and technology integration; students’ inability to identify their genuine shortcomings from the evaluation.

International design education research generally emphasizes the necessity of multi-dimensional evaluation, including indicators for cultural value, design logic, and human-AI collaboration quality (Creativity Research Journal, 2022). The current evaluation system in this course clearly fails to meet the innovative demands of the AIGC era.

3. Theoretical Foundation for Curriculum Teaching Reform

The AIGC-empowered reform of Ethnic Cultural Creative Design courses is not merely an update of teaching technology but a systematic reshaping of teaching philosophy, knowledge production methods, and learner roles. To ensure the theoretical validity of the reform, this paper constructs its theoretical foundation from five dimensions: educational change theory, learning sciences, cultural sustainability theory, human-AI collaboration theory, and design education paradigms.

3.1 Educational Change Theory: From “Tool Introduction” to “Structural Teaching Reform”

Research on educational change indicates that technology introduction only produces lasting reform effects when it impacts teaching structure, learning methods, and knowledge construction models (Fullan, 2020; Journal of Educational Change, 2022). As a strongly interventionist intelligent technology, if AIGC remains at the level of “tool supplementation,” it will fail to address the core issues of design courses.

According to Fullan’s (2020) “three-element model of educational change,” systematic teaching reform should encompass: introduction of new teaching resources (AIGC tools); change in learning modes (from linear to community-based learning); and reshaping of teacher roles and values (from knowledge source to learning designer). In this course, the reform focuses not only on tool use but also on: changing the mode of cultural learning; transforming the pathway for idea generation; restructuring classroom interaction; and shifting teacher identity from “demonstrator” to “human-AI collaborative design mentor.” This elevates the curriculum reform from “technology integration” to “structural change,” aligning with the basic logic of educational change theory.

3.2 Learning Sciences and Constructivism: Cultural Learning Must Achieve “Deep Knowledge Construction”

Learning science research shows that the quality of cultural courses depends on whether learners can achieve “deep cultural understanding,” rather than merely recognizing symbols (Laurillard, 2012; Biggs & Tang, 2011). Constructivism emphasizes: knowledge arises from learners’ active construction within authentic cultural contexts; culture cannot be learned through “symbol viewing” but must be understood through “contextualized experience”; creative generation is a derivative of cultural understanding, not an isolated skill training. This implies that traditional “pattern-imitation design” cannot support the learning objectives of Ethnic Cultural Creative Design courses. The introduction of AIGC enables cultural learning to encompass: intelligent analysis of cultural elements; cross-modal (text-image) cultural explanation; visual generation of cultural scenes; and the combination, deconstruction, and reconstruction of cultural symbols.

International research indicates that AI can provide “immediate feedback,” “cognitive scaffolding,” and “contextual reconstruction” in learning, thereby promoting the formation of deep cultural understanding (Kukulka-Hulme, 2023).

Therefore, this theory provides the cognitive basis for the course’s three-stage system: “cultural decoding—AI co-creation—design transformation.”

3.3 Human-AI Collaboration Theory: AIGC as “Creative Partner,” Not “Replacement”

Human-AI collaboration theory is the core support for AIGC teaching reform. Shneiderman (2022) points out that the value of AI in the creative field lies not in replacement, but in forming “complementary creation.”

From an HCI perspective, AI’s role in design education can be categorized into three types (Lee & Suh, 2023). Type 1: Generative Partner: jointly proposing visual solutions. Type 2: Reflective Partner: providing structured feedback. Type 3: Iterative Partner: accelerating the design cycle. In this course, human-AI collaboration manifests in: AI participating in the extraction and analysis of cultural elements; AI generating multiple solutions to stimulate divergent thinking; students performing cultural critique and design judgment on AI-generated content; teachers analyzing student thinking through the generation pathways of AI.

This bidirectional, complementary structure enables students to transition from “technology users” to “human-AI collaborative designers.”

3.4 Cultural Sustainability Theory: The Essence of Cultural Creative Design is “Creative Transformation of Culture”

UNESCO’s (2021) “Cultural Sustainability” framework emphasizes that cultural educational activities should find balance among “protection, transformation, and innovation.” Domestic scholars also argue that the value of ethnic cultural creative design lies in “achieving contemporary expression based on the spiritual essence of traditional culture” (Xu Wang, 2025).

Therefore, this course reform adheres to: prioritizing cultural value, avoiding simple symbol stacking, emphasizing cultural logic, ecological relationships, and aesthetic ethics, and using AIGC as an auxiliary medium for the creative transformation of culture.

In other words, AIGC can generate effects, but whether it can “generate culture” still depends on human judgment. Thus, pedagogy must guide students through the learning chain of “cultural critique—cultural translation—cultural reconstruction.”

3.5 Design Education Paradigm: From “Product-Oriented” to “Process-Oriented” Competency Development System

Design education research (Creativity Research Journal, 2022; Design Studies, 2023) indicates that modern design education is shifting from the past “product-centric” paradigm to a comprehensive cultivation path focusing on “design process, design thinking, fundamental understanding, and cultural value.”

This paradigm emphasizes four key competencies: cultural understanding, creative generation, technology application, and design transformation. In this course reform, these four competencies form the basis of teaching objectives and also constitute the key indicators for the subsequent evaluation system.

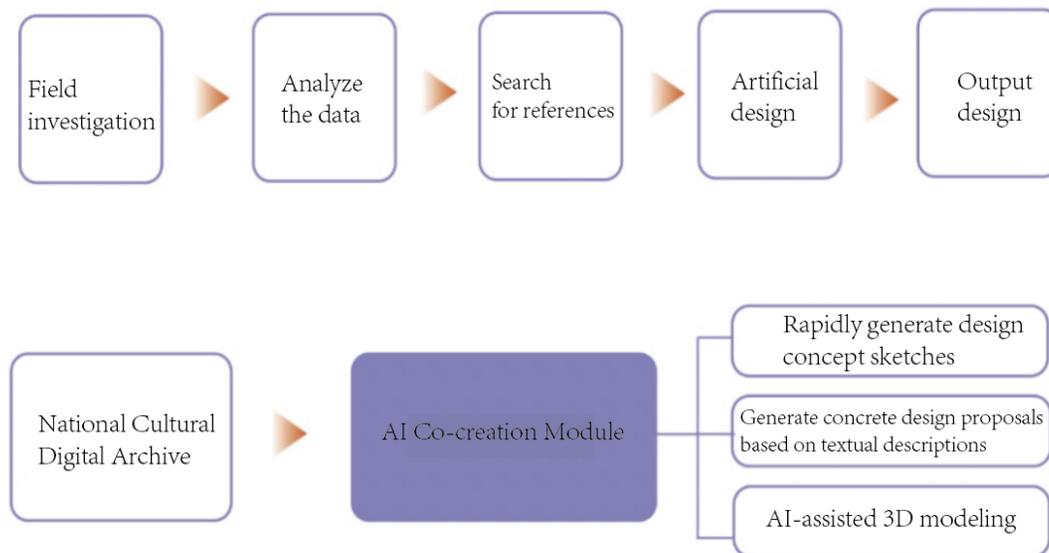
Especially in the AIGC environment, students must learn to: distinguish between the cultural “appearance” and “connotation” generated by AI; identify cultural biases and misinterpretations in AI outputs; exercise human aesthetic judgment on AI-generated design results; and translate AI-generated content into implementable design proposals.

Design education theory provides a “competency-based” pedagogical logic, enabling the curriculum reform to progress from “improving product quality” to “enhancing students’ competency structure.”

4. Practical Methods for Curriculum Teaching Reform

Based on the theoretical framework proposed in the previous chapter, this curriculum reform centers on the three-dimensional integration of “culture-technology-design.” It constructs a systematic teaching reform pathway through four aspects: restructuring teaching content, innovating teaching methods, building learning environments, and reforming the evaluation system. This practical approach follows the Technological Pedagogical Content Knowledge (TPACK) integration model, principles of human-AI collaboration (Shneiderman, 2022), Project-Based Learning (PBL), and the higher education change model (Fullan, 2020), aiming to build a cultural creative design course system suited for the AIGC era.

Figure 2: Cultural Creative Product Design Flowchart Integrated with AIGC Tools



4.1 Restructuring Teaching Content: Building a Three-Dimensional “Culture-Technology-Design” Integrated System

The traditional linear teaching structure of “culture first, design later” can no longer meet the demands of high-iteration, high-complexity design practice in the AIGC era. Therefore, this study restructures the course content into a three-stage system: “Cultural Decoding—AI Co-Creation—Design Transformation,” aiming to achieve deep coupling among cultural cognition, AI generation, and creative design.

4.1.1 Stage One: Cultural Decoding

In this stage, students achieve “deep cultural understanding” through: establishing a database of ethnic cultural materials (images, patterns, stories, rituals, materials); using AIGC for “feature clustering” and “style analysis” of cultural elements; understanding the historical context and cultural logic of symbols through case deconstruction; and using VR/AR scenarios to assist immersive cultural experiences (BJET, 2023).

Teaching Objective: To avoid symbolic imitation and establish a structural understanding of culture.

4.1.2 Stage Two: AI Co-Creation

AIGC is not viewed merely as an image generation tool but is positioned as a “creative partner.” Based on HCI’s human-AI collaboration theory (Lee & Suh, 2023), this stage emphasizes: using AIGC for divergent concept generation; inputting the cultural database into models as “cultural prompts”; performing cultural critique and ethical judgment on AI-generated results; and students co-exploring multi-directional visual expressions with AI.

Teaching Objective: To overcome creative bottlenecks through human-AI collaboration, improving the speed and diversity of idea generation.

4.1.3 Stage Three: Design Transformation

Using AI-generated content as visual stimuli or initial sketches, students complete: cultural logic correction, functional layout optimization, material and process adaptation, structural modification and producibility design, standardization and unification of visual systems, prototyping, and usage scenario simulation (Human Factors, 2022).

Teaching Objective: To achieve professional transformation from “AI images” to “implementable designs,” ensuring cultural depth and design feasibility.

4.2 Innovating Teaching Methods: “Dual-Mentor Guidance + AI Collaboration” Project-Driven Model

International research indicates that AI-integrated learning environments require a “multi-role learning support structure” (Teaching in Higher Education, 2023). Therefore, this course adopts the “Dual-Mentor Guidance + AI Collaboration” teaching method.

4.2.1 Dual-Mentor Structure (Dual-Mentor System)

Each learning group is supported by: A Subject Teacher (Mentor A), responsible for cultural theory, design methodology, aesthetic judgment, and cultural critique. An Industry Mentor (Mentor B), responsible for AIGC tool usage, model training, digital expression, and technical guidance.

The value lies in ensuring the cultural depth provided by the subject teacher and the technological forefront ensured by the industry mentor, avoiding an imbalance between “cultural depth” and “technological depth.” This model aligns with the “teacher-technologist collaboration model” proposed by BJET (2023), which can significantly enhance teaching quality in technology-intensive courses.

Figure 3: “Dual-Mentor Guidance + AI Collaboration” Project-Driven Model



4.2.2 AI Collaboration Mechanism

The course guides students to view AIGC as a learning partner, specifically manifested in four aspects: First, Creative Frontloading: AI intervention at the early creative stage, not just final rendering. Second, Multi-Round Iteration: Human and AI jointly complete modifications. Third, Cultural Verification: Students perform cultural identification on AI outputs. Fourth, Reflective Learning: Teachers analyze student thinking paths through AI outputs. This embodies the HCI principle of “AI participation in early cognitive stages” (Shneiderman, 2022).

4.2.3 Project-Driven Learning

The course centers on real cultural themes as project tasks, e.g., Yunnan Yi ethnic pattern cultural creative products, digital design of Miao silver ornament patterns, Dai bamboo weaving element lifestyle product design. Each project follows stages of cultural research, AI generation and critique, solution screening, design refinement, and outcome presentation.

Actual Outcomes: Students’ cultural interpretation ability, completeness of design expression, and technology application skills all improved significantly, consistent with domestic research findings (Sun Yan, 2024).

4.3 Flipped Classroom and Immersive Learning: Building a Smart Learning Environment

Influenced by smart education concepts, this course enhances learning experience through a blended teaching model of “online knowledge learning + offline co-creation lab.”

4.3.1 Flipped Classroom

The course pre-records the following content as micro-lectures: cultural symbol analysis methods, AIGC tool basics, AI prompt construction, cultural decoding methods. Students self-study before class. Classroom time is used for: cultural critique, design discussion, AI-generated result diagnosis, and group co-creation. This realizes the value shift from “knowledge transfer” to “knowledge application” (Teaching in Higher Education, 2023).

4.3.2 Immersive Learning Environment

The course is equipped with: an AI Creative Workshop for model training, visual generation, and design iteration; a VR Ethnic Culture Experience Room for immersive cultural contextualization (Cultural Studies, 2022). The immersive environment helps students understand cultural space, lifestyle, and cultural aesthetics.

4.4 Multi-dimensional Evaluation System: Constructing a “Process—Outcome—Cultural Value” Tripartite Evaluation Model

To address the defects of the traditional “product-only” evaluation, this study constructs:

4.4.1 Evaluation Dimensions

(1) Depth of Cultural Understanding (30%)

Cultural analysis report; historical interpretation of cultural symbols; ability for cultural critique of AI-generated content.

(2) Idea Generation and Design Process (30%)

Number of iterations; quality of human-AI collaboration; creative thinking pathways.

(3) Quality of Design Outcome (30%)

Feasibility; innovation; aesthetic consistency.

(4) Technology Application and Ethical Awareness (10%)

Appropriate use of AIGC; identification of model bias; ethical judgment of AI outputs.

This model aligns with international trends in multi-dimensional evaluation (Creativity Research Journal, 2022).

5. Outcomes of Curriculum Teaching Reform

Based on the three-dimensional “culture-technology-design” integration system and the “dual-mentor guidance + AI collaboration” teaching model, this course’s teaching reform has achieved significant outcomes in learning effectiveness, educational paradigms, industry linkage, and cultural innovation. These outcomes are reflected not only in improved student competencies but also in the replicability of the course paradigm for other cultural and art courses and its leading significance for universities’ digital transformation.

5.1 Constructing a “Culture + Technology” Integrated Course Paradigm, Providing a Replicable Pathway for Design Education

By empowering cultural creative design with AIGC, this course’s “Three-Stage Integrated System” (Cultural Decoding—AI Co-Creation—Design Transformation), formed through teaching practice, has been validated as a universal teaching framework applicable to courses like Intangible Cultural Heritage Design, Regional Cultural Product Development, and Digital Art Creation (Shi Lulu & Wu Jingyi, 2025).

International research also indicates that technology-enhanced cultural learning can effectively promote deep understanding and creative transformation (Cultural Studies, 2022). This course’s practice aligns highly with this research direction and directly serves as a model for the following courses: Yunnan Intangible Cultural Heritage Creative Design, Digital Expression of Ethnic Symbols, Culture and Innovative Design Methods, and Regional Cultural Visual System Design.

For instance, in the Yunnan Intangible Cultural Heritage Creative Design course, teachers adopted this course’s methodology to construct a process of “cultural symbol database + AIGC style transfer + productization design standards,” enabling students to generate cultural product designs that blend traditional aesthetics with modern functionality in a short time.

Figure 4: Pattern Extraction Completed with AI Assistance (Coursework)

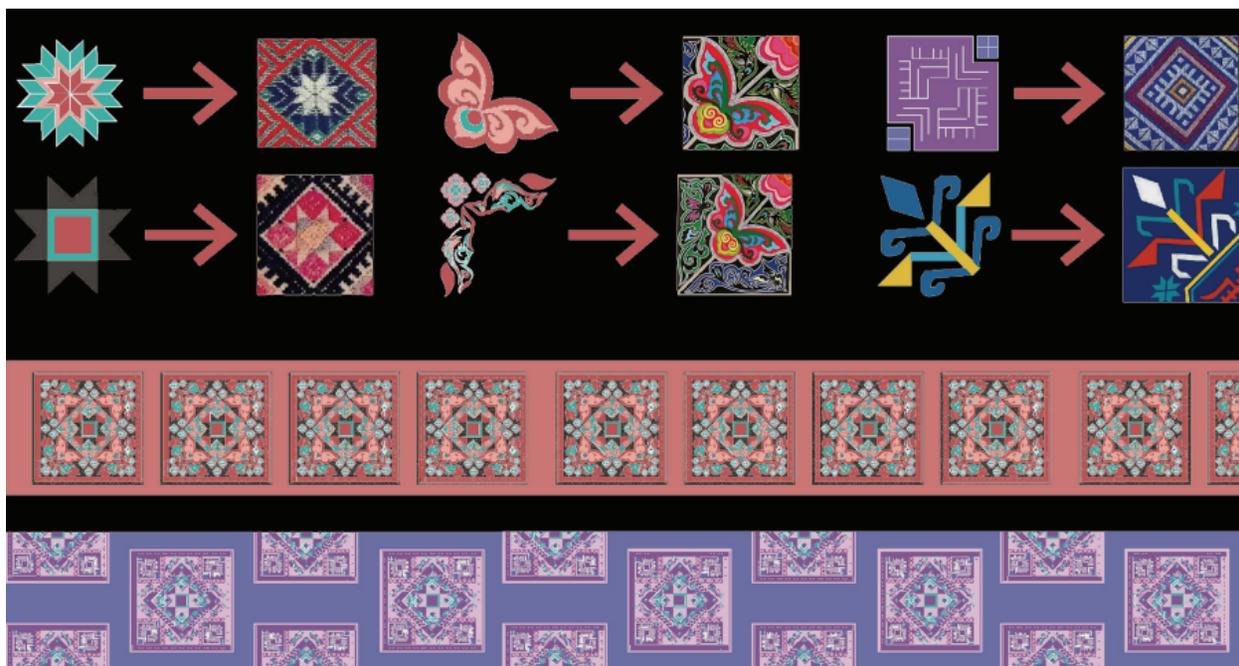
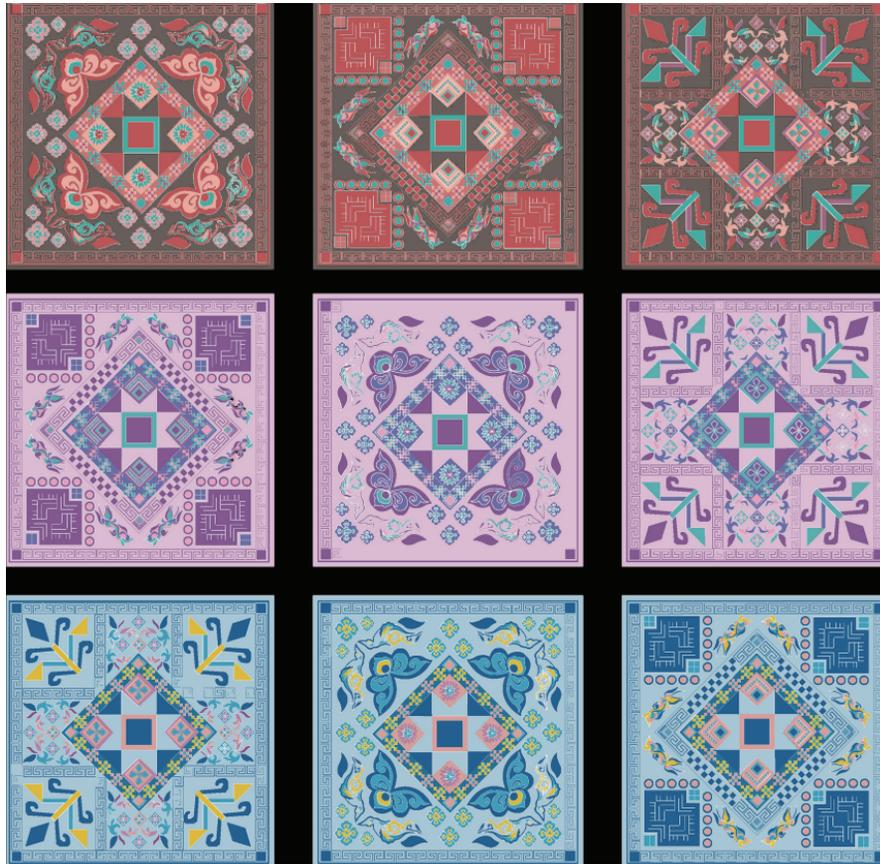


Figure 5: Pattern Reconstruction and Design Transformation Completed with AI Assistance (Coursework)



This indicates that the reform path possesses cross-course transferability and is a “future classroom model” applicable to design courses.

5.2 Innovating the “Human-AI Collaboration” Teaching Paradigm, Changing the Structure of Higher Education Teaching

With the introduction of AIGC, student roles shifted from “technology executors” to “human-AI collaborative designers.” This transformation reflects the “Augmented Creativity” concept proposed in HCI research (Shneiderman, 2022).

In this course, the “human-AI collaboration competency” students acquired is mainly reflected in: being able to perform cultural critique on AI-generated content within cultural contexts; viewing AI as a creative partner, not a replacement or simple tool; using AI for concept divergence, comparison, and deep iteration; understanding AI generation logic to adjust prompts for better accuracy. Course data indicates: about 84% of students could independently construct a human-AI collaborative design workflow after the course; over 70% continued using AIGC as a creative stimulus tool in subsequent courses; most students felt AI intervention significantly reduced “blank canvas anxiety.”

These conclusions align highly with international educational research: AI can significantly improve learners’ creative confidence, exploration willingness, and design efficiency (Teaching in Higher Education, 2023).

5.3 Enhancing Students’ Cultural Understanding, Design Innovation, and Technology Application Abilities

After implementing the reform, students showed significant improvement in three key competency dimensions.

(1) Enhancement of Cultural Understanding

Through cultural analysis, AI-assisted cultural reconstruction, and cultural critique, students could more accurately explain the spirituality, functionality, and cultural logic of cultural symbols; identify the deep structure of cultural elements rather than staying at surface symbols; maintain cultural authenticity during design transformation. Classroom works showed students progressed from “imitating patterns” to “constructing cultural narratives,” consistent with the concept of “deep cultural transfer” proposed in domestic research (Liang Xiaoyu et al., 2025).

(2) Significant Enhancement of Idea Generation and Design Innovation (Creative Ideation)

AIGC intervention at the early design stage shifted students' thinking mode from unidirectional divergence to multi-path exploration. Quantitative course data: The average number of design concepts generated per student increased from 3–5 to 20–40; the creative iteration cycle shortened by approximately 60%; creative breakthrough points increased noticeably, and visual exploration dimensions became richer. This aligns with the research conclusion in *Creativity Research Journal* (2022) that “AI promotes creative divergence.”

(3) Enhancement of Technology Application Ability; Students Shift from Tool Users to “Technology Thinkers”

After the course, students could actively use AIGC to explore visual directions in the early creative stage; use prompt engineering to control generation style; use style transfer to reproduce cultural aesthetics; and perform ethical judgment and bias identification (e.g., cultural misinterpretation) on AI-generated content. Consistent with domestic research (Wang Yanping, 2025; Jing Jiajia, 2025), AIGC application significantly enhanced the technology transfer ability of design students.

5.4 Promoting Innovation in the Ethnic Cultural Creative Industry, Building Industry-Education Integration Chains with Enterprises

This course reform not only enhanced student competencies but also promoted the establishment of collaborative chains between the university and cultural enterprises, tourism organizations, and intangible cultural heritage workshops.

Completed collaborations include: 12 product designs with Yunnan ethnic cultural creative enterprises; 6 sets of creative proposals with local tourism organizations; 3 pattern digitization projects with intangible cultural heritage workshops. Enterprise feedback indicated that proposals designed using AIGC collaboration were more visually appealing to the market, aligned better with trendy aesthetics, and showed more innovation in craft expression.

This confirms the value of educational reform for industrial innovation and reflects the concept of “parallel development of cultural innovation and cultural inheritance” proposed in Cultural Sustainability theory (UNESCO, 2021).

5.5 Leading the Update of Educational Philosophy, Assisting University Digital and Intelligent Teaching Reform

The course reform drives art and design programs in universities from “knowledge transmission” to “competency cultivation,” and from “product-oriented” to “process-oriented,” exhibiting the following typical characteristics: Shift in Teaching Roles: Teachers changed from “knowledge providers” to “learning designers.” Shift in Learning Method: Students changed from “passive imitators” to “human-AI collaborative creators.” Shift in Course Resource Form: Resources shifted from “static textbooks” to a “dynamic knowledge ecosystem” (AI generation, VR scenes, cultural databases). Integration of Teaching, Learning, and Evaluation: The evaluation system shifted from “product evaluation” to “process-culture-technology integrated evaluation.” These changes align with the “new paradigm for higher education teaching in the intelligent era” proposed in international research (*The Journal of Higher Education*, 2023).

6. Limitations and Future Prospects

Although this course's AIGC-empowered teaching reform achieved significant results, certain limitations remain. These limitations manifest in technological cultural bias, uneven teacher competency, student dependency tendencies, difficulties in quantifying the evaluation system, and ethical risks of AIGC in ethnic cultural contexts. Recognizing these limitations is significant for further optimizing the course system and enriching the theory and methods of human-AI collaborative teaching in the future.

6.1 Limitations

6.1.1 Risk of Bias in AIGC's Cultural Understanding and Generation Persists

Although AIGC can assist in cultural analysis and idea generation, its cultural learning is based on big data inference rather than genuine cultural experience. International research points out that AI carries risks of “semantic drift,” “cultural misinterpretation,” and “stereotyped generation” when handling specific or ethnic cultures (Noble & Benden, 2023; *Cultural Studies*, 2022).

Course practice also observed that some models simplified ethnic symbols into “pattern templates”; AI struggled to understand the ritualistic meanings of certain cultural symbols; students frequently needed to culturally correct AI outputs.

This indicates that AIGC must be used cautiously in the cultural domain, with teachers' cultural oversight and aesthetic judgment remaining necessary.

6.1.2 Differences in Teachers' AIGC Application Abilities Affect Teaching Uniformity

Disparities in teachers' information literacy and AIGC technical skills impact the depth and stability of course dissemination. Teaching observations showed that some teachers could not design structured prompts; some could not identify cultural biases in AI-generated content; the technical depth of the course varied significantly depending on the teacher. This aligns with domestic and international research: teachers' competency development lags noticeably in the AI era (Teaching in Higher Education, 2023; Jing Jiajia, 2025).

6.1.3 Students Are Prone to Dependence on AIGC, Affecting Autonomy in Creative Thinking

AIGC's high-speed generation capability can lead students to reduce independent thinking, adopting a passive "AI generates first, then I select" approach; dependency on rapid visual generation leads to insufficient logical reasoning; weakening of cultural analysis; being misled by visually appealing images in design judgment (Human Factors, 2022). Some students failed to develop critical AI use skills, resulting in "cognitive inertia" during the design process.

6.1.4 Quantitative Indicators in the Evaluation System Still Have Room for Improvement; Fully Measuring Student Competency Remains Challenging

Although this study constructed a four-dimensional "Cultural Value—Creative Process—Design Outcome—Technology Ethics" evaluation system, challenges remain: depth of cultural understanding is difficult to fully quantify; quality of human-AI collaboration (quality of AI use) lacks unified standards; assessment of student creative iteration quality relies more on teacher experience. This aligns with international critiques of innovation education evaluation: innovative learning inevitably faces the structural dilemma of "insufficient quantification and over-reliance on qualitative judgment" (Creativity Research Journal, 2022).

6.1.5 Copyright and Cultural Ethical Issues Related to AIGC Are Not Fully Resolved

Both domestic and international research point out numerous copyright disputes and cultural ethical risks associated with AIGC in the design field (Lee & Suh, 2023). These include: opacity in model training data sources; whether AI "infringes on cultural intellectual property" remains a gray area; minority cultures, as vulnerable cultures, need protection against misuse or commodification by AI tools. This implies the future need to further establish usage norms at the teaching level.

6.2 Future Prospects

6.2.1 Deepening AIGC Application in Cultural Narrative Generation and Cultural Semantic Modeling

Future research could explore: cross-modal (text-image) narrative generation; AI-based cultural symbol semantic modeling; constructing fine-tuned AIGC models specific to ethnic cultures (e.g., LoRA / DreamBooth modes). This would enable AI not only to "generate images" but also to generate stories, semantic chains, and cultural structures with cultural logic.

6.2.2 Optimizing "Human-AI Collaborative Design Processes," Establishing Replicable Teaching Models

Based on this course's experience, future work could further construct: shared human-AI prompt libraries; AI style transfer libraries for cultural themes; human-AI iteration maps; AIGC-based course knowledge graphs. International research indicates that establishing "replicable, transferable" human-AI collaboration models is a core trend in design education (BJET, 2023).

6.2.3 Strengthening Teacher AIGC Literacy Training, Promoting University Digital Transformation

Future teaching reform should focus on: teacher AI literacy certification systems; teacher technical workshops and interdisciplinary communities; development of AI teaching materials, case databases, and teaching templates. Teachers' digital competency is a key variable for the sustainability of teaching reform (Altbach & de Wit, 2023).

6.2.4 Establishing a More Scientific Learning Evaluation System, Enhancing Comprehensive Assessment of Culture, Technology, and Innovation

Future research could investigate: quantitative analysis of learning trajectory data; transparency of AI process records; analysis of process evidence like student logs and prompt version iterations. This would optimize student competency diagnosis, making evaluation more objective and data-driven.

6.2.5 Expanding AIGC Application in Diverse Ethnic Cultures, Promoting Cultural Digital Asset Construction

Potential developments include: image databases for diverse ethnic cultures; intelligent recognition models for intangible cultural heritage patterns; digital assets for ethnic cultures; multi-modal teaching resource libraries for diverse ethnic cultures. Collaborating with domestic intangible cultural heritage enterprises, tourism enterprises, and cultural institutions could help enhance cultural digitization capabilities and support cultural industry innovation.

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