

Creative Integration of Intangible Cultural Heritage Techniques in Three-Dimensional Space Design Teaching: Curriculum Design and Implementation

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Abstract: The creative integration of intangible cultural heritage (ICH) techniques into three-dimensional space design represents an innovative pedagogical approach within the course *Three-Dimensional Space Design (3ds Max, SketchUp)*. This study explores the incorporation of the Dongguan national-level ICH item—the “Thousand-Horn Lantern”—into classroom teaching. The initiative aims to develop students’ creative thinking while promoting moral education through cultural experience. By embedding heritage elements in professional training, students enhance their technical and aesthetic skills, develop an appreciation for traditional culture, and foster cultural confidence and identity. This teaching model ultimately contributes to cultivating application-oriented undergraduate talents with both artistic creativity and moral integrity.

Keywords: *Three-Dimensional Space Design, Intangible Cultural Heritage, Creative Integration*

1. Introduction and Research Background

The *Law of the People’s Republic of China on Intangible Cultural Heritage* (2010), which came into effect on June 1, 2010, explicitly stipulates that “schools shall bear the responsibility of transmitting intangible cultural heritage.” This legal provision provides both a clear policy foundation and a forward-looking direction for integrating the study and preservation of Dongguan’s intangible cultural heritage, particularly traditional handicraft techniques—into the curriculum of environmental design programs.

The course *Three-Dimensional Spatial Design (3ds Max, SketchUp)* is a core compulsory module within the Environmental Design major. Established in 2010 and recognized in 2022 by the Department of Education of Guangdong Province as a provincial level “first-class hybrid undergraduate course,” it plays a crucial role in cultivating students’ spatial design competence and aesthetic literacy.

Intangible cultural heritage not only bears witness to the evolution of history but also serves as a precious cultural resource of profound value. It embodies the spiritual essence of a nation and stands as a vital symbol of local identity and cultural continuity. *Dongguan’s Thousand-Angled Lantern (Qianjiao Deng)*, originating from the royal lanterns of the Song Dynasty, is a distinctive form of traditional folk craftsmanship unique to Dongguan, Guangdong Province. The lantern, composed of a thousand lamps arranged in numerous three-dimensional triangular structures, integrates various traditional arts such as painting, paper-cutting, and embroidery. Each lantern is handcrafted without blueprints or prototypes, relying entirely on oral transmission and apprenticeship. Owing to its long history, grand scale, and exquisite craftsmanship, it has been hailed as the “*Lantern of the Ages*”. In 2006, it was inscribed on China’s National List of Intangible Cultural Heritage and has since received the Shanhua Award Gold Medal and the honorary title of “*China’s No. 1 Lantern*”.

Rich in Confucian, Buddhist, and Taoist cultural elements as well as local customs, the Thousand-Angled Lantern offers significant research value.

Universities, as key institutions for the inheritance of national culture, shoulder the responsibility of integrating local folk arts into academic curricula to enhance students’ humanistic literacy and stimulate their creative thinking.

This course adopts an “*Internet + Artificial Intelligence*” blended teaching model to explore innovative approaches to hybrid education. Guided by the *Outcome-Based Education (OBE)* philosophy, it emphasizes learner-centered pedagogy that shifts from “teaching-oriented” to “learning-oriented” modes. Through online platforms such as *Chaoxing Learning and Xueyin Online*, the course incorporates lesson preparation, instructional videos, teacher–student interaction, and formative assessments into an

integrated learning ecosystem. This approach effectively merges teaching and learning, improves learning quality, and provides students with individualized learning pathways that meet the diverse needs of different educational roles.

2. Current Challenges in Art Education

For much of the twentieth century, Chinese art education operated within a dialectic between the “ancient and modern” and the “Chinese and Western.” Historically, the Soviet model dominated, emphasizing realism and thematic creation. However, in the era of globalization and rapid economic growth, this system has shown limitations: curricula are overly rigid, discussions and dialogue are minimal, and innovation is undervalued.

Many students lack critical thinking, self-learning capacity, and distinct artistic styles. The neglect of individual differences has led to homogeneity and a shortage of creative thought. Consequently, traditional pedagogical methods can no longer meet the requirements of modern talent cultivation, often reducing students’ professional identity and hindering their long-term development.

3. Literature Review

Research on Dongguan’s *Thousand-Horn Lantern* has expanded steadily. Representative works include:

- Li, Hongming. (2019). *Inheritance and Protection of Folk Handicraft Intangible Cultural Heritage: A Case Study of Dongguan’s Thousand-Horn Lantern*.
- Li, Shuyi. (2020). *The Aesthetic Connotation of Dongguan’s Thousand-Horn Lantern*.
- Feng, G. (2021). *Cultural Exploration of the Thousand-Horn Lantern in Dongguan*.
- Li, Wenli., Zhang, Mu., & Bai, Hua. (2021). *Protective Development of Folk Handicraft ICH: The Case of the Thousand-Horn Lantern*.
- Guo, Mengke. (2022). *Transmission and Protection Pathways of the Thousand-Horn Lantern*.
- He, Shuai. (2022). *Cultural Connotations and Value of Dongguan’s Thousand-Horn Lantern in the Digital Era*.

Additionally, several studies by the author have examined the integration of Dongguan’s ICH resources into higher education curricula, including *Application of Thousand-Horn Lantern Techniques in Visual Communication Design* and *Integrating Dongguan’s ICH into University Art Design Courses: Research and Practice*. The teaching reform project *Integrating Thousand-Horn Lantern Techniques into Visual Communication Education* was approved and completed by the Guangdong Department of Education in 2022.

The Guancheng Cultural Service Center in Dongguan also plays a significant role in training inheritors and documenting the *Thousand-Horn Lantern* craftsmanship through multimedia. Growing scholarly attention continues to highlight its cultural and educational value.

4. Teaching Innovation and Implementation

4.1 Pedagogical Philosophy

In accordance with the 2022 *Key Work Points of the Ministry of Education*, which promotes educational digitalization and smart learning platforms, this course merges traditional ICH culture with digital design teaching. The goal is to develop an innovative, localized teaching model that connects cultural heritage with modern technology while advancing moral education and regional development. Contemporary design education faces three structural disjunctions: a gap between knowledge transmission and competence development, between technical expertise and cultural literacy, and between skills training and value formation. Guided by Outcome-Based Education (OBE) principles and constructivist learning theory, this course establishes a teaching framework characterized by “cultural guidance, problem orientation, and digital empowerment.” Through the integrated sequence of “Initiate, Appreciate, Practice, Evaluate, and Exhibit,” the course facilitates a shift from mere knowledge delivery

to meaning-making and deep learning. ^[1]

4.1.1 Initiate: Cultivating Motivation through Situated Cultural Context

The “Initiate” phase draws on situated learning theory to spark student motivation by embedding learning in an authentic cultural environment. Prior to class, students decode symbolic elements of the *Qianjiao Lantern* via the Chaoxing online platform, engaging not only in information retrieval but in an immersive encounter with an intangible cultural heritage context. During class, live demonstrations by an artisan heritage bearer render tacit craft knowledge visible, enabling students to develop an ontological understanding of traditional craftsmanship. This design aligns with the concept of “legitimate peripheral participation,” allowing students to move from peripheral observation toward meaningful participation in a living cultural practice, thereby fostering a deeper sense of cultural identity. ^[2]

4.1.2 Appreciate: Advancing Cultural Understanding through Visual and Semiotic Analysis

The “Appreciate” phase integrates visual culture studies and semiotic theory to help students interpret symbolic systems embedded in traditional culture. Using the *copper-coin pattern* as an example, instructors not only analyze its formal features—such as the “round exterior and square interior”—but also unpack the underlying philosophy of harmony between heaven and humanity as well as the embedded wisdom of traditional craftsmanship. This semiotically informed pedagogy invites students to move beyond surface aesthetics to grasp deeper cultural structures, marking a cognitive shift from formal appreciation to cultural understanding. ^[3] Comparative analyses of localized design practices by international design master’s further strengthen students’ capacity for cultural translation and promote the creative transformation of tradition.

4.1.3 Practice: Integrating Dewey’s “Learning by Doing” With Reflective Practice

The “Practice” phase embodies Dewey’s “learning by doing” and Schön’s reflective practice. While demonstrating the modeling of the copper-coin pattern, the instructor not only presents the technical steps but also verbalizes the design decision-making process through a “think-aloud” approach that externalizes often-implicit design reasoning. ^[4] For students, completing the modeling task becomes a developmental progression from technical imitation to creative application. Vygotsky’s Zone of Proximal Development is activated here through appropriately challenging creative tasks that induce productive cognitive conflict and stimulate learners to extend their current capability boundaries. ^[5]

4.1.4 Evaluate: A Multi-Dimensional, Evidence-Based Assessment System

The “Evaluate” phase establishes an evidence-based assessment system that shifts evaluation from summative judgment to a tool for continuous improvement. Formative assessment employs learning analytics to mine data from students’ online behaviors, enhancing the precision of instructional interventions. ^[6] The values-oriented dimension introduces a value-clarification model that guides students to reflect on design ethics, cultural responsibility, and related issues, thereby nurturing professional ethical awareness. This multi-layered system exemplifies the core principle of formative assessment—*assessment as learning*—supporting the development of students’ metacognitive capacities. ^[7]

4.1.5 Exhibit: Socially Situated Learning through Communities of Practice

The “Exhibit” phase embodies a social constructivist perspective by placing students’ design outputs within authentic sociocultural contexts through a “community of practice” model ^[8]. When student works move from the classroom to exhibition spaces and from virtual models to physical artifacts, the social and cultural significance of learning becomes fully realized. This form of project-based socialized learning cultivates professional identity while contributing to the contemporary revitalization of intangible cultural heritage through the circulation of cultural products.

4.1.6 Innovation: Digital Humanities as a Methodological Bridge between Tradition and Modernity

At the level of innovative application, the course introduces digital humanities methodologies. Through parametric modeling and virtual reality, students digitally deconstruct and reconstruct the cultural genes of the *Qianjiao Lantern* ^[9]. This process is not merely technical but serves as a methodological experiment in modern cultural translation. When students construct a digital twin of the lantern, they are effectively engaging in creative cultural transformation consistent with Gadamer’s notion of a “fusion of horizons”—a dialogue between modern design languages and traditional craft wisdom that generates new cultural meaning ^[10].

4.1.7 Value Formation: Integrating Moral Development into Professional Education

In alignment with the educational mission of fostering virtue, the course embeds value guidance throughout the instructional process. Drawing on care ethics, it constructs a learning environment saturated with cultural care, enabling students to develop an emotional connection with local culture alongside their technical learning^[11]. This subtle, non-didactic approach surpasses traditional ideological instruction and achieves a dialectical unity between skill development and value cultivation.

4.2 Instructional Framework

The course addresses three main challenges:

- 1) Weak autonomous learning and application abilities
- 2) Insufficient cultural integration within professional content
- 3) Limited creative and critical thinking

Teaching progresses through three stages—*foundation, advancement, and refinement*—structured by five key processes: **Introduction, Appreciation, Practice, Evaluation, and Exhibition.**

4.3 Introduction (Pre-Class Learning)

Students preview videos and reference materials on the *Thousand-Horn Lantern* via *Chaoxing Learning*, collecting cultural design elements. In-class, demonstrations by ICH inheritors introduce symbolic and aesthetic features, reinforcing students' understanding and appreciation of traditional culture.

4.4 Appreciation (Case Analysis)

Teachers present case studies analyzing motifs such as ancient coin patterns, international design examples, and award-winning student works. These analyses strengthen aesthetic judgment and link heritage art with contemporary design practices.^[12]

4.5 Practice (Hands-on Creation)

Students use *3ds Max* to model traditional motifs and apply them to modern interior design elements such as screens or lamps. Online and offline group discussions, interactive exercises, and peer critiques encourage collaboration and self-assessment.

4.6 Evaluation (Assessment Criteria)

Assessment consists of:

- Process evaluation: 40% (participation, online learning, engagement)
- Group evaluation: 15%
- Assignment evaluation: 15%
- Extended practice: 25% (competitions, social service)
- Moral education reflection: 5%

This comprehensive evaluation model integrates knowledge acquisition, skill development, and moral cultivation.

4.7 Exhibition (Showcasing Results)

Outstanding works are exhibited online and offline. Students collaborate with artisans and enterprises to turn digital designs into physical products, some of which are commercialized or presented in professional competitions. Participation in such projects strengthens creativity, teamwork, and vocational readiness.

In addition, the course explores VR modeling of the *Thousand-Horn Lantern*, extending traditional

craftsmanship into digital environments and fostering innovative cultural transmission.

4.8 Discussion

The integration of Dongguan's ICH into *Three-Dimensional Space Design* achieves dual goals: enhancing artistic education and cultivating moral values. By combining digital technology with traditional culture, the teaching model fulfills the educational principle of "fostering virtue through teaching." The hybrid *Internet + AI* approach enables personalized learning, real-time feedback, and adaptive assessment.

This model represents a forward-looking educational innovation that aligns with the goals of modern higher education: building intelligent, data-driven, and humanistic learning ecosystems that emphasize inclusiveness, creativity, and cultural continuity.^[13]

5. Conclusion

This study demonstrates how incorporating Dongguan's *Thousand-Horn Lantern* culture into digital design teaching revitalizes intangible heritage while enhancing students' cultural identity, creativity, and professional competence. The blended, OBE-oriented instructional framework not only fosters deeper engagement but also encourages moral reflection and social responsibility.

Through design competitions, enterprise collaboration, and applied projects, students gain practical experience and confidence in cultural innovation. Ultimately, this integrated approach contributes to both cultural sustainability and the development of high-quality, application-oriented design professionals capable of serving local and national cultural development.

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