

Goguryeo Tomb Murals in Ji'an: Visual Representation and Educational Practice

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ABSTRACT

This study focuses on the visual symbolic features of the Goguryeo tomb murals in Ji'an and their application value in modern art education. It aims to explore innovative pathways for cultural symbols in educational transformation. Created between the 4th and 7th centuries, the Ji'an Goguryeo murals showcase the religious beliefs, social structure, and aesthetic ideals of the ancient Goguryeo Kingdom, forming an essential part of East Asian historical and cultural heritage. Although extensive research has been conducted on the historical and artistic value of these murals, their role in the educational transmission and transformation of heritage symbols remains underexplored. Using semiotic analysis, this study examines these mural symbols' forms, functions, and cultural meanings, analyzing their digital re-creation within modern educational contexts. It further evaluates how these re-created symbols enhance students' cross-cultural understanding, artistic expression, and creative capacities. The results demonstrate that digital creation endows traditional symbols with new interactivity and expressiveness within education, reinforcing students' cultural identity and offering fresh insights for art and design education. This study provides theoretical and practical support for the application and innovation of traditional cultural symbols in digital education, expanding the scope of cultural heritage within contemporary education.

Key words: Goguryeo Tomb Murals In Ji'an, Representation, Semiotics, Digital Creation, Educational Practice

INTRODUCTION

The Goguryeo tomb murals in Ji'an are located within the tombs of the Goguryeo Kingdom in Ji'an, Jilin Province, China, and were created between the 4th and 7th centuries, over 1,300 years ago. These murals were painted as part of tomb decorations to honor the deceased, using symbolic images and motifs to depict the religious beliefs, social customs, and daily life of the kingdom. In 2004, the cities, royal tombs, and noble burial sites of Ji'an were included in the UNESCO World Heritage List at the 28th World Heritage Conference (Suzhou, 2004). As a key component of World Heritage, the Goguryeo murals hold immense historical and artistic value. These murals not only illustrate the religious beliefs, aesthetic sensibilities, and social organization of the Goguryeo Kingdom but also reflect East Asia's cross-cultural interactions. The symbolic images encapsulate a wealth of cultural information, offering insights into the spiritual world and cultural beliefs of ancient times, making these murals a unique case in heritage studies.

Although extensive research has been conducted on the cultural and historical significance of the Goguryeo murals—particularly in the fields of history, archaeology, and

art—their use as educational resources for cultural transmission and engagement remains insufficiently explored. In particular, current studies have paid limited attention to how these ancient cultural symbols can enhance students' cultural literacy and artistic comprehension through modern educational methods. Traditional education often relies on static displays and textual explanations, which may not adequately convey the deeper cultural meanings embedded in these mural symbols. Consequently, students' active participation and creativity in the cultural transmission process can be limited.

With advances in digital educational technology, new possibilities have emerged for the reinterpretation and re-creation of mural symbols within educational contexts. By transforming these traditional symbols into modern digital forms, students gain the ability to visually engage with the cultural meanings conveyed in the ancient murals, while also experimenting with the symbols through creative practices. The design and creation of digital symbols enable art students to develop a deeper understanding of the cultural and artistic essence behind these symbols, further stimulating their expressive potential in art. This method not only surpasses the limitations of static traditional education but

also enhances students' cultural awareness and artistic literacy through interactive and creative engagement.

Accordingly, this study aims to explore the transformation of Goguryeo mural symbols into digital formats suitable for modern art and design education, analyzing their potential value in cultural transmission and art education. By creating and applying digital symbols, students can deepen their understanding and appreciation of cultural heritage, thereby enhancing their creative abilities and cultural literacy. This research seeks to provide practical and theoretical support for the integration of Goguryeo cultural symbols into contemporary education.

Research Objectives

This study aims to examine the cultural symbols of the Goguryeo tomb murals in Ji'an and their educational value, applying digital symbol creation techniques within modern art and design education. By employing semiotic analysis, the study provides an in-depth interpretation of the cultural symbols within these murals, assessing their roles in cultural transmission and educational contexts. Additionally, this research explores how digital creation can effectively transform these symbols into educational resources, enhancing students' cultural understanding and practical creative skills. Ultimately, the study seeks to offer an innovative pathway for heritage education, facilitating the integration of traditional cultural symbols into contemporary learning environments.

LITERATURE REVIEW

Visual Cultural Symbols in Murals

Semiotics serves as a key theoretical tool for understanding the visual cultural symbols of the Goguryeo tomb murals in Ji'an. Barthes' (1977) "sign-significance" theory provides insight into the metaphorical functions of various symbolic elements within these murals. As an assemblage of symbols, the murals communicate specific religious beliefs, social customs, and expressions of political power through visual iconography. Geng Tiehua, in his research on Goguryeo murals, notes that religious symbols appearing in the murals—such as sun, moon, stars, phoenixes, and dragons—are not merely images but crucial representations of belief within the Goguryeo cultural system. These symbols reflect distinct aesthetic principles of East Asian art, particularly in their composition and spatial layout. The visual representation of these symbols reinforces both royal authority and a sense of national identity, establishing the murals as vehicles for cultural transmission across history (Geng, 2017).

Moreover, visual symbols often carry implicit metaphorical meanings (Šorm & Steen, 2018). In this study, visual metaphors refer to symbols that adhere to design principles within a visual language while conveying deeper cultural and conceptual meanings. By analyzing visual symbols through different interpretive "levels of viewing," we can examine the relationship between the explicit forms of visual symbols and their underlying connotations, thus elevating their cultural significance (Figure 1). From the perspective of burial

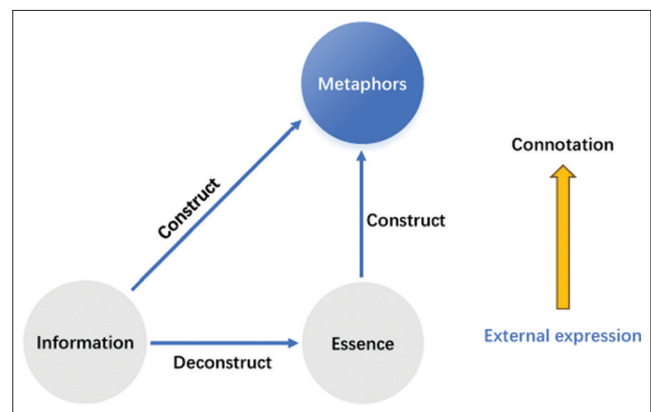


Figure 1. Visual metaphoric process

rites and religious beliefs, artisans imbued abstract concepts with vivid visual forms. Through this symbolic visual language, they conveyed meanings that resonate between the deceased and the living, and between the deceased and the imagined afterlife.

Additionally, visual cultural symbols in the murals often reflect aspects of social life through depictions of human figures, animals, and plants. For instance, The hunting scenes and banquet imagery in the Goguryeo murals depict aspects of upper-class life, conveying intricate social hierarchies and concepts of daily life from that era. Under a semiotic lens, these symbols represent specific societal power dynamics and hierarchical systems, forming a comprehensive system of symbolism (Leschziner & Brett, 2021). These symbols not only possess artistic value but also provide a unique perspective on Goguryeo society, serving as crucial references for understanding the cultural and semiotic implications within the murals.

Cultural Representation of Murals

Murals serve not only as visual art but also as vessels of cultural values and social ideologies. Stuart Hall's (2024) cultural representation theory suggests that murals, as cultural media, express the cultural background, religious beliefs, and values of their creators. Goguryeo tomb murals reveal a blend of religion and social life through detailed use of color and distinctive compositional techniques. The mythological and ritualistic images within the murals not only depict the sanctity of religious ceremonies but also establish a unique system of cultural representation for the Goguryeo people (Kim, 2020). Liu (2015) comparative analysis of the Ji'an Goguryeo tomb murals and burial paintings from other regions in the Central Plains found striking similarities in decorative motifs, despite temporal differences. These motifs are both decorative and symbolic, reflecting the beliefs, cultural values, and aesthetics of the people of that era.

The cultural representation of Goguryeo murals also reveals traces of cross-cultural exchanges, especially in their interactions with Han culture in East Asia. Zilin and Sibo (2008) research indicates that the use of color and depiction of figures in Goguryeo murals were influenced by Han culture from the Central Plains, yet they retained

unique Goguryeo aesthetic qualities, resulting in a hybrid cultural representation system. This cross-cultural integration imbued the murals with complex cultural meanings and highlighted Goguryeo's unique position in East Asian cultural exchanges (Min, 2024). As such, these murals are not only carriers of cultural information but also symbols of interaction and fusion among different civilizations, revealing the depth and diversity of cultural exchanges in ancient East Asia.

The representation of Goguryeo culture is multifaceted. From religious beliefs to mural art and dance depictions, these diverse perspectives showcase the uniqueness and diversity of Goguryeo culture. The visual representations in the Goguryeo tomb murals embody not only significant artistic value but also serve as an essential reflection of the cultural and spiritual identity of the Goguryeo people. By studying and analyzing these representations, we gain a comprehensive understanding of the cultural characteristics and historical transformations within Goguryeo society. Furthermore, these murals offer valuable insights and inspiration for modern artistic creation, actively contributing to the preservation and development of regional culture.

Digital Educational Practice of Murals

In digital educational practice, the symbols and images of traditional murals are represented through digital technology, transforming them into valuable resources for modern art education. This process goes beyond mere restoration or static display, instead, it involves the reconstruction of cultural symbols through digital symbol creation, making these symbols relevant to contemporary educational needs. Scholars have found that the digital transformation of symbols not only enriches students' visual experiences but also enhances their deeper understanding of cultural symbols. For example, Alt and Raichel (2020) examined the application of digital technology in traditional art education, arguing that digital creation can deepen students' perception and understanding of traditional cultural symbols. Similarly, Pavlou (2020) noted that digital symbol transformation enhances student engagement through interactivity, helping them better comprehend the cultural meanings embedded in the symbols.

Within the context of cultural education, digital symbol creation provides students with an innovative learning approach, enabling them to understand the essence of traditional cultural symbols through hands-on practice and creative work. Lähdesmäki et al. (2022) study demonstrates that students can independently explore and reinterpret cultural symbols through digital symbol creation, fostering both their creative thinking and cultural awareness. In this way, the application of digital symbols goes beyond mere display, it promotes the transmission and innovative expression of cultural meaning through participatory learning. This educational model has gradually become an important trend in art education, particularly in visual communication design courses, providing students with a new framework and methodological support for creative practice.

RESEARCH METHODOLOGY

This study employs qualitative analysis to explore the digital transformation of symbolic elements from the Goguryeo tomb murals in Ji'an and their educational impact. By examining students' understanding and creative expressions of cultural symbols, the research methodology addresses several key aspects.

This study selected 50 second-year undergraduate students majoring in Art and Design at the author's university as research participants. The students, aged between 18 and 22, had completed foundational courses in art and design, equipping them with basic design skills and enabling them to comprehend the semiotic theories and engage in the digital creation practices outlined in this study.

To scientifically assess the students' understanding of the mural symbols from the Goguryeo tombs, a comprehensive evaluation framework was developed, incorporating both a pre-test and a post-test. The pre-test aimed to measure the students' initial level of familiarity with the cultural symbols of Goguryeo, while the post-test was designed to evaluate their progress after participating in digital creation training. The assessment focused on three dimensions: symbol recognition, understanding of cultural connotations, and creative application capabilities.

The study focuses on the primary visual symbols within the Goguryeo tomb murals, particularly those representative of Goguryeo culture, such as religious totems, natural symbols, and scenes of social life. As core components of cultural heritage, these symbols embody profound historical and aesthetic significance. Through digital transformation, these traditional symbols are designed as educational materials suited to modern learning contexts, allowing us to investigate their potential value in enhancing art students' cultural comprehension and creative abilities.

To comprehensively analyze the effects and educational significance of symbol transformation, this study incorporates an extensive review of archaeological, artistic, and semiotic literature on the Goguryeo tomb murals, which provides a theoretical foundation for digital symbol creation. The students' process of creating digital symbols was divided into three stages: (a) Concept Sketching – students designed symbol sketches manually through hand drawing; (b) Digital Processing – students utilized Adobe Photoshop and Illustrator to digitize their hand-drawn sketches, including optimizing the symbol's form, extracting lines, and adjusting colors; and (c) Exploration of Multi-Media Applications – after completing the basic symbol designs, students used 3D modeling software (e.g., Blender) to further explore the potential applications of the symbols in product design, such as integrating mural elements into wayfinding systems and derivative products. Firsthand data are collected from students' digital symbol creations, observing how they interpret and express these symbols in their work.

In line with the research objectives and data sources, this study uses qualitative methods, specifically semiotic analysis and comparative analysis. Through semiotic analysis, the study interprets the symbolic meanings and cultural implications of major mural symbols, considering historical

background, religious beliefs, and social structures to uncover the rich cultural information underlying each symbol. This approach clarifies the meaning of each symbol and provides theoretical support for its visual representation in digital transformation. A comparative analysis of students' digital creations with the original mural symbols assesses the effectiveness of the digital transformation in conveying cultural symbolism, including the retention of visual characteristics, the completeness of cultural meanings, and the students' innovative adaptations.

The data analysis relies primarily on qualitative coding, categorizing mural content and students' work into themes. Theoretical frameworks from semiotics and cultural studies guide the analysis, ensuring a focus on the research questions. Additionally, a comparative analysis of students' digital works reveals the impact of symbol transformation, allowing for an evaluation of the educational value of digital learning in cultural understanding.

RESEARCH RESULTS

Comparison of Symbol Forms

The traditional symbols in the Goguryeo tomb murals in Ji'an carry rich aesthetic characteristics and cultural connotations, showcasing a unique visual style (Table 1). First, the forms and lines of the symbols exhibit a high degree of abstraction and geometric shapes. Through simple yet powerful lines, the murals depict animal totems, natural landscapes,

and human figures, making the symbols visually distinctive and easily recognizable. Second, in terms of color, the mural symbols predominantly use deep, stable tones such as red, black, and gold, emphasizing a sense of history and religious mysticism (Figure 2), while highlighting the symbolic nature of the signs. Lastly, the shapes of the symbols are balanced and symmetrical, conveying the aesthetic concepts of ancient art through harmonious spatial arrangements that impart a sense of order and cultural resonance to the viewer.

When transforming these traditional symbols into digital forms for modern educational purposes, the design needs to retain the essence of the original while adapting to contemporary art and design needs for better educational application. First, color processing simplifies and adjusts the original muted tones, opting for more vivid hues to enhance visual appeal. Next, the reconstruction of lines and shapes utilizes simpler, smoother digital lines to express traditional forms, emphasizing a modern aesthetic. The digitalization process also allows for the design of composite patterns, enabling students to better understand the cultural meanings behind these symbols (Figure 3).

Through this transformation, the digital symbols retain traditional cultural elements while offering increased visual appeal and interactivity, making them suitable for the diverse needs of modern education. Digital symbols not only stimulate students' interest in learning but also help them understand the historical background and cultural significance behind the symbols through intuitive visual experiences.

Table 1. Comparison of Mural Symbols and Digital Symbols









	Mural Symbols	Digital Symbols
Lines	 <p>The "Worshipping Buddha" image features fluid and lively lines, though some parts are missing.</p>	 <p>Extracting line drawings using digital software for secondary creative development.</p>
Colors	 <p>The mural's colors have significantly faded.</p>	 <p>The colors can be digitally restored.</p>
Shapes	  <p>The original shapes are distinctive.</p>	  <p>After digitization, the patterns can be recombined.</p>



Figure 2. Nuwa and fuxi symbols



Figure 3. Pattern combination design

This approach successfully achieves the inheritance and innovation of cultural symbols within the educational field.

Comparison of Symbol Functions

In the Ji'an Goguryeo tomb murals, symbols serve not only as decorative elements but also fulfill significant symbolic and expressive functions, encapsulating rich cultural and religious meanings (Table 2). Symbols such as the sacred bird and the sun reflect the Goguryeo people's reverence for mysterious forces, representing the core of societal belief at the time, carrying a sense of sanctity and spiritual guidance. Additionally, these symbols reflect the hierarchical structure and social stratification of the Goguryeo society, embodying the social order and cultural traits of that period. Through depictions of buildings, clothing, and artifacts, the symbols communicate the cultural identity of the Goguryeo people, providing the viewer with a sense of belonging. In modern digital education, these symbols are transformed into "knowledge points," using hierarchical digital designs to help students systematically understand the structure and deeper meaning of Goguryeo culture. This continuation of symbolic function not only stimulates students' cultural curiosity but also guides them in exploring the historical background and cultural depth behind the symbols.

In the selection of specific symbols, the author chose patterns that appear frequently in the murals. The animal

symbol is the "Three-Legged Crow," the attire symbol is Nuwa's clothing, and the plant symbols are the lotus and the Bodhi tree. The "Three-Legged Crow," regarded as a sacred bird in Goguryeo, is depicted at the center of the sun, symbolizing power, vitality, and the harmony between heaven, earth, and humanity, reflecting the Goguryeo people's reverence for natural forces. Nuwa's attire features intricate patterns such as cloud and wave motifs, representing the connection between nature and divinity while also reflecting societal hierarchies and the sanctity of female figures. The lotus symbolizes purity and the cycle of life, while the Bodhi tree represents wisdom and enlightenment, embodying the spiritual and philosophical dimensions of Goguryeo culture under Buddhist influence. Together, these symbols illustrate the profound cultural expression in Goguryeo murals and provide valuable inspiration for modern design.

Goguryeo mural symbols also possess significant emotional transmission functions, expressing respect for nature, ancestors, and deities through color and spatial arrangement, creating a solemn and reverent atmosphere. These visual symbols evoke emotional resonance, encapsulating the historical memories and spiritual values of the Goguryeo society. In modern education, digital technologies, through interactive design and multimedia effects, extend this emotional transmission function, allowing students to experience traditional cultural expressions immersively. This enhances their identification with and understanding of historical culture. Such an approach not only bridges the gap between contemporary individuals and traditional culture but also helps students deeply appreciate the emotional value of cultural expressions (Figure 4).

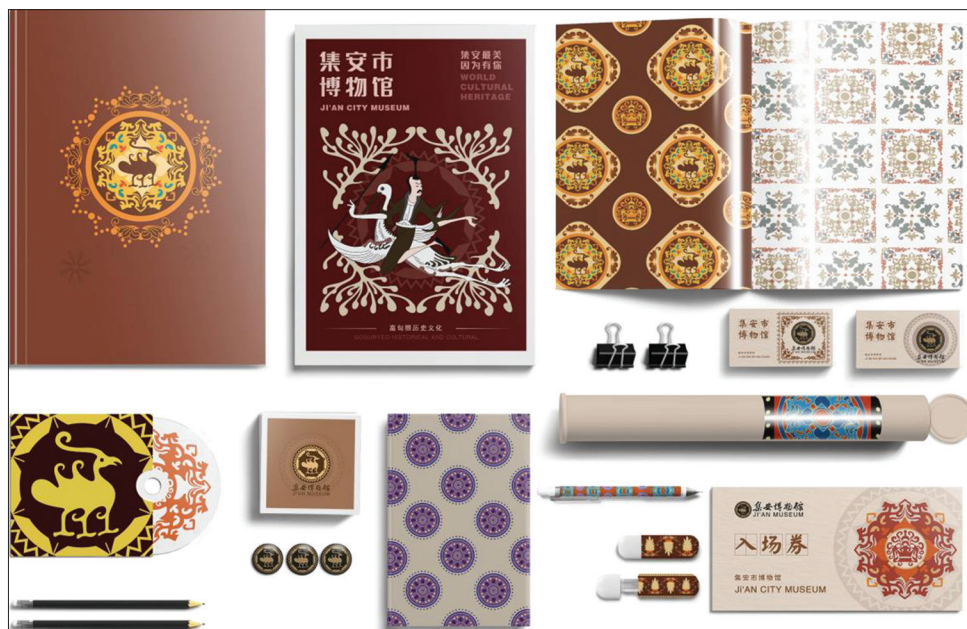
Furthermore, mural symbols play an essential role in cultural inheritance within traditional cultures. As visual carriers, they document aspects of Goguryeo history, mythology, and daily life, serving as key memories within the cultural framework. In modern education, digital symbols facilitate the transmission of culture in a more accessible way, making them suitable for classroom teaching, long-term preservation, and cross-cultural communication (Figure 5). Digital symbol design is highly adaptable, allowing further development to meet educational needs, and helping students to understand and appreciate the Goguryeo cultural heritage. This form of cross-temporal transmission aligns with contemporary educational needs and offers new avenues for the global dissemination of Goguryeo culture.

Reflection on Cultural Significance

The symbols in the Ji'an Goguryeo tomb murals carry profound cultural significance, with their reflection encompassing various aspects such as religious beliefs, social values, and ethnic identity (Figure 6). The images in the Goguryeo murals are not only artistic expressions but also a condensation and symbol of the social culture of the time, reflecting the spiritual world of ancient people and their reverence for nature and deities. For example, the sacred bird and the sun in the murals symbolize the Goguryeo people's awe of supernatural forces, embodying their respect for the cycles of life, the order of nature, and their belief in the protection of

Table 2. Comparison of functions of mural symbols and digital symbols

Function Type	Mural Symbol Function	Digital Symbol Function
Symbolic Function	Religious belief, power representation, cultural identity	Structuring knowledge, multi-layered cultural understanding
Emotional Function	Emotional resonance, evocation of historical memory	Immersive experience, emotional resonance and identification
Inheritance Function	Transmission of historical knowledge, continuation of family and ethnic memory	Sustainability of educational resources, cross-cultural communication

**Figure 4.** Practical application of office VI system design**Figure 5.** Practical application of office supplies

their ancestors. These symbols convey not only an individual's admiration for mysterious forces but also the Goguryeo kingdom's recognition of collective belief and social order, further solidifying national identity.

As time progresses, the cultural significance of the mural symbols has been reinterpreted from modern perspectives. In current art and design education, the reflection on these symbols integrates considerations of cross-cultural

understanding and cultural identity (Figure 7). The religious and social meanings embedded in the traditional mural symbols offer modern students a unique historical viewpoint, helping them recognize that cultural symbols are not just visual representations but also a way of preserving cultural memory and collective consciousness. This reflective process helps students comprehend the underlying values, cultural meanings, and spiritual essence

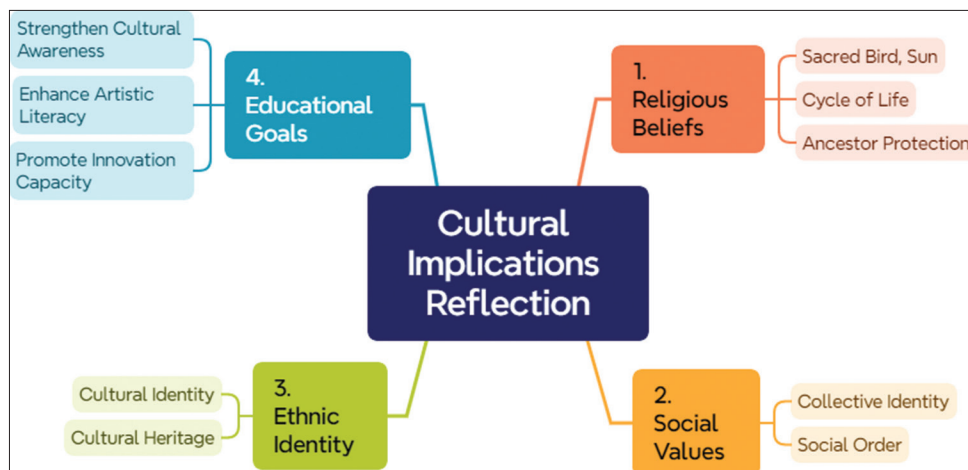


Figure 6. Reflection on cultural significance



Figure 7. Application of pattern design on silk scarves

of these symbols, fostering a multi-dimensional understanding of them.

In modern digital educational practices, the cultural significance of mural symbols, once restructured, guides students to reflect on the relevance of traditional symbols in contemporary contexts. These symbols are no longer just historical artifacts; they become part of cultural dialogue, reminding students to appreciate cultural diversity and the changes and developments these symbols undergo in different eras and social environments. Through the transformation and application of digital symbols, students are able to reassess the cultural significance of traditional symbols and express, transmit, and innovate on this cultural understanding with a deeper level of comprehension in their creative work. This reflective process not only enhances students' cultural sensitivity but also promotes inclusivity and recognition of diverse cultures in their artistic creations.

Comparison of Improvements in Students' Understanding

The measurement results (Figure 8) indicate that students made significant progress in three areas: symbol recognition, cultural understanding, and creative application. In terms of symbol recognition, the average score increased from 42.8% in the pre-test to 87.4% in the post-test, representing an improvement of 44.6%. This demonstrates that

the digital creation practice significantly enhanced students' ability to recognize the basic forms and information of mural symbols. For example, students' ability to recognize the morphological features and cultural significance of the "Sunbird" symbol in the murals significantly improved, with 92% of students accurately describing its symbolic meaning. In cultural understanding, students' scores rose from 37.0% to 85.0%, with a growth of 48.0%. Notably, their ability to analyze the symbolic meanings of architectural types, clothing features, and artifacts showed remarkable improvement. Regarding creative application, students' ratings increased from 3.8 to 4.5 out of 5, reflecting an increase of 18.4%. This indicates that through integrating modern design concepts into digital symbol creation, students' innovation capacity and technical expression were effectively enhanced.

Pathways to Enhancing Students' Artistic Creative Literacy

In-depth analysis and cross-cultural comparative studies of the cultural symbols in the Goguryeo tomb murals are crucial avenues for cultivating students' understanding and transmission of cultural significance (Figure 9). By analyzing the symbolic meanings behind elements like the sacred bird and the sun, students can connect with the unique cultural context of the Goguryeo murals, gaining insights into the religious beliefs and worldview of the time. Additionally, through cross-cultural comparative analysis, students can grasp the diverse ways symbols are expressed across cultures, incorporating these visual languages into their own creative work, thereby expanding their creative thinking.

In the area of symbol creation, digital tools are used to train students to reconstruct and transform the core elements of traditional symbols, equipping them with modern creative techniques. Practical activities also encourage students to apply Goguryeo symbols in real-world projects such as product design, advertising, and packaging design, enhancing the expressive power and continuity of symbols in contemporary applications.

In fostering aesthetic and innovation skills, aesthetic analysis of mural symbols and diversified artistic expression

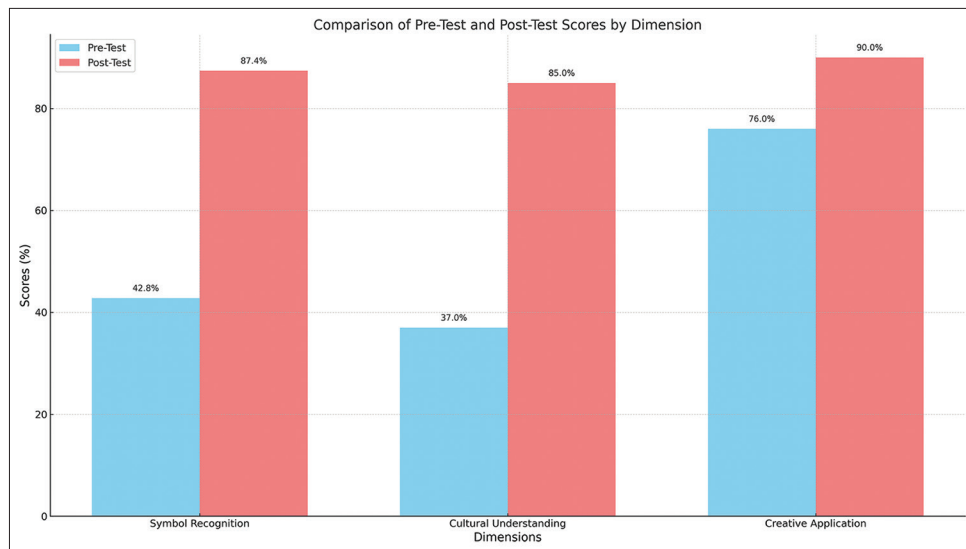


Figure 8. Improvement in students' understanding

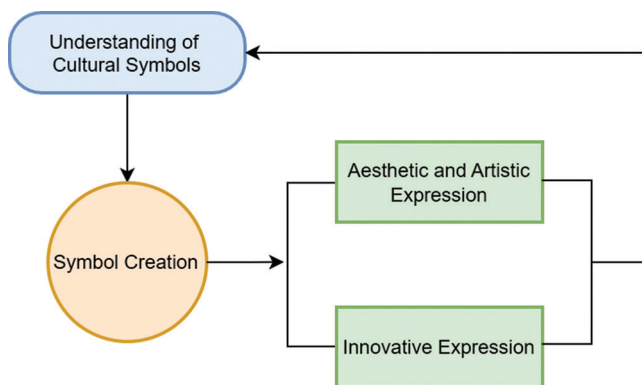


Figure 9. Pathways to enhancing artistic creative literacy



Figure 10. Practical application of signage

training enable students to master and apply the aesthetic value of symbols, incorporating cultural meaning into their artistic creations. Students are encouraged to explore the expression of mural symbols through different art forms, gradually developing a unique artistic style. Furthermore, through innovative interpretation and conceptual expression training, students can merge traditional symbols with modern design principles, engaging in symbolic reinterpretation to enhance their creative thinking and the application of symbolic language (Figure 10). Ultimately, this educational pathway, from understanding to creation and innovation, contributes to the improvement of students' cultural cognition and artistic literacy, offering them new methods for integrating traditional cultural symbols into modern design.

DISCUSSION

The digital transformation of Goguryeo mural symbols has significant implications for enhancing students' cross-cultural understanding and artistic creativity. Previous research suggests that digital technology can enrich the expression of cultural symbols, facilitating students' deepened understanding of multicultural perspectives through comparative

analysis and creative reinterpretation (Xiaoyan & Hui, 2019). By examining and reconstructing the shapes and colors of these symbols, students not only strengthen their sense of cultural identity but also develop a greater openness to diverse cultures. The digital design of symbols allows students to freely explore contemporary expressions of traditional symbols in their creative work, a process aligned with Shadieff and Huang's (2020) findings on the role of digital technology in cross-cultural education, fostering students' development of unique artistic styles.

Moreover, digital symbol design serves as an innovative educational tool, enabling students to better understand the cultural symbolism embedded in these symbols and stimulating their interest in cultural heritage and artistic expression (Chen & Sharudin, 2024). Through digital reproduction, Goguryeo mural symbols offer students a sense of emotional resonance and cultural identity, consistent with Mujallid's (2024) research on the role of digital learning in enhancing students' emotional engagement. The modernization of these symbols allows students to connect with the profound cultural meanings of Goguryeo heritage on an emotional level and to find links with traditional culture in their creative work. Studies have shown that the visual and interactive qualities of digital design encourage students to explore diverse media

within contemporary art (Al Hashimi et al., 2019), revitalizing traditional symbols in a modern context.

Future research could further investigate the nuanced transmission of symbolic emotions and meanings, expanding the application of these symbols within cross-cultural exchanges (de Castro Salgado et al., 2012). Such exploration would provide additional theoretical support for cross-cultural education while offering practical insights for the design of digital educational tools, thus advancing the innovative application of cultural heritage within the field of education.

CONCLUSION

This study explores the innovative application of cultural symbols in modern education through the digital transformation of the Goguryeo tomb mural symbols. The research reveals that traditional symbols serve not only as carriers of cultural knowledge but also as catalysts for enhancing students' artistic creativity and cross-cultural understanding. Through the digital design of symbols, students gain multidimensional visual experiences and deepen their understanding of Goguryeo culture during the interactive process, fostering emotional resonance.

Moreover, this digital application broadens the pathways for cultural transmission, allowing traditional art to adapt to contemporary educational needs while revitalizing it through diverse media expressions. This approach provides new perspectives for art design education, semiotics, and cultural studies. The findings contribute not only to improving students' cultural literacy but also lay the foundation for further exploration of digital strategies for cultural symbols and the potential for education and communication in a globalized context.

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