

A Five-Dimensional Framework for AI-Assisted Cultural Design Learning in Visual Design Education: Evidence from Chinese Tiger Symbolism

Yan Yikang¹, Jamilah binti Omar^{1*}, Tian Lili²

¹Department of Art Education, Faculty of Art, Sustainability & Creative Industry, Universiti Pendidikan Sultan Idris, 35900 Tanjong Malim, Perak, Malaysia

²Faculty of Art, Dezhou Vocational and Technical College, 253034 Dezhou, Shandong, China

*Corresponding Author

DOI: <https://doi.org/10.47772/IJRISS.2026.100500817>

Received: 19 May 2026; Accepted: 25 May 2026; Published: 15 June 2026

ABSTRACT

Artificial intelligence has been increasingly used in art and design education, but its use in culturally oriented visual design learning still lacks a clear pedagogical framework. Many existing studies focus on AI image generation and technical efficiency, while less attention has been given to how AI can support students' cultural understanding, creative thinking, and reflective design practice. This study proposes a five-dimensional framework for AI-assisted cultural design learning in visual design education, using Chinese tiger symbolism as a case. The framework includes five connected dimensions: cultural and symbolic, visual and formal, creative and technical, emotional and psychological, and educational and experiential. Based on a qualitative case study, the research draws on student design artefacts, reflection materials, semi-structured interviews with students and teachers, expert feedback, and classroom observations. The preliminary findings show that the framework helped students move from a general use of tiger images to a deeper understanding of cultural meaning. It also supported the translation of symbolic meaning into visual forms, guided AI prompt design and image generation, and encouraged students to revise their designs through reflection and feedback. The study argues that AI-assisted cultural design learning becomes meaningful when cultural interpretation, visual translation, AI exploration, emotional expression, and pedagogical reflection work together. This research contributes a structured framework for integrating AI tools with cultural symbol learning in visual design education. It also provides practical guidance for teachers who aim to combine digital technology, cultural heritage, and creative learning in design courses.

Keywords: AI-assisted design education; cultural design learning; five-dimensional framework; Chinese tiger symbolism; visual design education; creative learning

INTRODUCTION

Artificial intelligence has become an important part of contemporary art and design practice. In recent years, generative AI tools have been widely used for image creation, visual exploration, style testing, and creative ideation. These tools can quickly produce different visual possibilities and help designers expand their

imagination. In visual design education, AI also provides new opportunities for students to explore form, color, composition, and visual expression. However, the use of AI in education should not be understood only as a technical process. If AI is used only to generate attractive images, students may depend too much on the tool and ignore cultural meaning, design thinking, and critical reflection.

Visual design education is not only about producing visual outcomes. It also involves meaning-making, cultural understanding, creative judgment, and communication. This is especially important when students work with cultural symbols. Cultural symbols are not simple decorative elements. They carry historical meanings, emotional values, and social memories. When such symbols are used in design education, students need to understand their cultural background before transforming them into new visual forms. Therefore, the integration of AI into cultural design learning requires a clear pedagogical framework. Without such a framework, AI-generated works may look visually rich but remain weak in cultural meaning and educational value.

Chinese tiger symbolism provides a meaningful case for this study. In Chinese culture, the tiger is not only an animal image but also a strong cultural symbol. It is often related to power, courage, protection, authority, vitality, and good fortune. Tiger images appear in traditional painting, folk art, festival objects, children's clothing, paper-cutting, decorative patterns, and cultural products. These visual forms offer rich resources for design learning. At the same time, tiger symbolism also creates a useful context for students to explore how traditional cultural meanings can be translated into contemporary visual design with the support of AI tools.

Existing studies on AI and design have discussed image generation, creative assistance, design efficiency, and human-AI collaboration. Studies on cultural design have also examined the value of traditional symbols and heritage-based visual expression. However, these two areas are often discussed separately. There is still limited research on how AI can support students' cultural understanding and creative learning in a real visual design classroom. More importantly, there is a lack of a clear framework that can guide students from cultural interpretation to visual translation, AI-assisted generation, emotional expression, and reflective learning. This gap shows the need for a structured model that connects AI tools, cultural symbols, visual design practice, and student learning experience.

To respond to this gap, this study proposes a five-dimensional framework for AI-assisted cultural design learning in visual design education. The framework includes five connected dimensions: cultural and symbolic, visual and formal, creative and technical, emotional and psychological, and educational and experiential. These five dimensions are used to explain how students understand Chinese tiger symbolism, transform cultural meaning into visual form, use AI tools for creative exploration, express emotional meaning, and reflect on their learning process. The framework does not treat AI as an independent image generator. Instead, it positions AI as a supporting tool within a culturally grounded and pedagogically guided design process.

This study is based on a qualitative case study of AI-assisted tiger-symbol visual design learning. It draws evidence from student design artefacts, reflection materials, semi-structured interviews, teacher feedback, expert opinions, and classroom observations. The aim is not to measure AI performance in a technical sense, but to explore how AI can support cultural design learning when it is guided by a clear educational framework. By focusing on Chinese tiger symbolism, the study also shows how traditional cultural resources can be renewed in contemporary visual design education.

This paper contributes to AI-assisted design education in two main ways. First, it develops a five-dimensional framework that connects cultural meaning, visual form, AI creation, emotional expression, and learning experience. Second, it provides practical insights for teachers who want to integrate AI tools into cultural and creative design courses. The study argues that AI-assisted cultural design learning becomes meaningful only when technological exploration is combined with cultural understanding, human judgment, and reflective

teaching practice.

LITERATURE REVIEW

AI in Visual Design Education

Artificial intelligence has changed the way visual design is created, taught, and learned. In recent years, generative AI tools have been widely used in image creation, style exploration, visual composition, and creative ideation. These tools allow users to produce many visual options in a short time. In design education, this can help students test ideas, compare different visual directions, and develop design concepts more quickly. AI can also support students who have limited technical skills, because it gives them a visual starting point for further design development.

However, AI in visual design education should not be understood only as a tool for producing images. If students only use AI to generate attractive pictures, the learning process may become shallow. Students may focus on the final visual effect and ignore cultural meaning, design logic, and critical thinking. Therefore, the key issue is not simply whether AI can generate images, but how AI can be used in a meaningful teaching process. In this sense, teachers need to guide students to use AI as a tool for exploration, comparison, reflection, and improvement.

Human–AI collaboration is also important in design education. AI can provide many possible visual outputs, but students still need to decide which outputs are meaningful, suitable, and culturally appropriate. The student's role is not replaced by AI. Instead, students need to write prompts, select images, revise results, and judge the quality of design works. This process shows that AI-assisted design still depends on human judgment. In cultural design learning, this judgment becomes more important, because students must consider whether AI-generated images respect and communicate cultural meanings.

Cultural Symbolism and Visual Design Learning

Visual design is not only a technical activity. It is also a process of meaning-making. Designers use images, colors, forms, patterns, and composition to communicate ideas and emotions. When cultural symbols are used in visual design, the designer needs to understand their historical and cultural meanings. Otherwise, cultural symbols may become simple decoration without deeper value.

Cultural design learning asks students to move from “using symbols” to “understanding symbols”. This means that students should not only copy traditional patterns or images, but also think about what these symbols mean, why they are important, and how they can be transformed into contemporary design language. In design education, this process can help students develop cultural awareness, visual literacy, and creative thinking.

Chinese tiger symbolism is a strong example of cultural symbolism. In Chinese culture, the tiger is often connected with power, courage, protection, authority, vitality, and good fortune. It appears in many traditional visual forms, such as folk art, traditional painting, New Year pictures, tiger-head shoes, paper-cutting, decorative patterns, and cultural products. These forms provide rich visual materials for students. At the same time, the tiger is not only a visual image; it also carries symbolic meaning. For example, a tiger can express strength, protection, bravery, or spiritual power.

For visual design education, Chinese tiger symbolism has two values. First, it provides visual resources, such as tiger stripes, tiger eyes, body shape, facial expression, color, and traditional patterns. Second, it provides cultural meanings that can guide the design concept. When students use AI to create tiger-themed designs, they need to connect these two aspects: visual form and cultural meaning. This connection is the basis of culturally

meaningful AI-assisted design learning.

Project-Based Learning and Creative Design Practice

Project-Based Learning, or PBL, is useful for design education because design learning often happens through real tasks. In PBL, students learn by solving problems, completing projects, making decisions, receiving feedback, and improving their work. This is close to the nature of visual design practice. Students do not only learn theory; they also apply knowledge in a real or simulated design context.

In an AI-assisted cultural design project, PBL can help organize the learning process. Students can begin with cultural research, then move to visual analysis, AI prompt design, image generation, selection, revision, and final reflection. This project process allows students to connect cultural knowledge with design practice. It also helps them understand that design is not a one-step process. Instead, design involves repeated thinking, testing, evaluation, and improvement.

PBL is also useful because it supports student-centered learning. In a tiger-symbol design project, students are not passive receivers of knowledge. They actively search for tiger meanings, collect visual references, write prompts, compare AI outputs, and revise their design works. Teachers still play an important role, but mainly as guides and facilitators. They help students understand cultural meanings, judge design quality, and avoid over-reliance on AI.

Reflection is another important part of PBL. In AI-assisted design learning, reflection can help students explain why they choose certain visual forms, how they use AI, what problems they meet, and how they improve their work. Through reflection, students can become more aware of their own design thinking and learning process. This is important for developing creative, technical, and cultural competencies.

The Need for a Framework in AI-Assisted Cultural Design Learning

Although AI has strong potential in visual design education, its use needs a clear framework. Without a framework, students may use AI in a random way. They may enter simple prompts, accept AI outputs directly, and focus only on visual beauty. This may lead to weak cultural expression and limited learning value.

A framework is needed to guide students from cultural understanding to visual design action. In cultural design learning, students first need to understand the meaning of the cultural symbol. Then they need to translate this meaning into visual elements. After that, they can use AI to explore different design possibilities. They also need to evaluate whether the AI output is culturally suitable, emotionally clear, and visually effective. Finally, they need to revise the design and reflect on the learning process.

This study responds to this need by proposing a five-dimensional framework for AI-assisted cultural design learning. The framework includes five dimensions: cultural and symbolic, visual and formal, creative and technical, emotional and psychological, and educational and experiential. Each dimension has a clear role.

The cultural and symbolic dimension focuses on meaning. It asks students to understand what the tiger represents in Chinese culture. The visual and formal dimension focuses on visual translation. It asks students to transform cultural meaning into forms, patterns, colors, and composition. The creative and technical dimension focuses on AI use. It includes prompt design, image generation, variation, and human–AI decision-making. The emotional and psychological dimension focuses on the feeling and emotional effect of the design, such as strength, protection, mystery, or affinity. The educational and experiential dimension focuses on student learning, reflection, AI literacy, creative competence, and cultural competence.

These five dimensions are connected rather than separate. In practice, students may move back and forth among them. For example, after seeing an AI-generated image, a student may realize that the tiger image does not express protection clearly. Then the student may return to the cultural meaning, adjust the visual form, revise the prompt, and generate a new version. This shows that AI-assisted cultural design learning is an iterative process.

Before presenting the proposed framework, it is necessary to clarify how the reviewed literature supports the conceptual structure of this study. The literature suggests that AI-assisted cultural design learning cannot be explained by AI technology alone. It requires the integration of visual design education, cultural symbolism, Chinese tiger symbolism, project-based learning, human–AI collaboration, and educational technology. Figure 1 summarizes these key literature foundations and shows how they support the development of the five-dimensional framework.

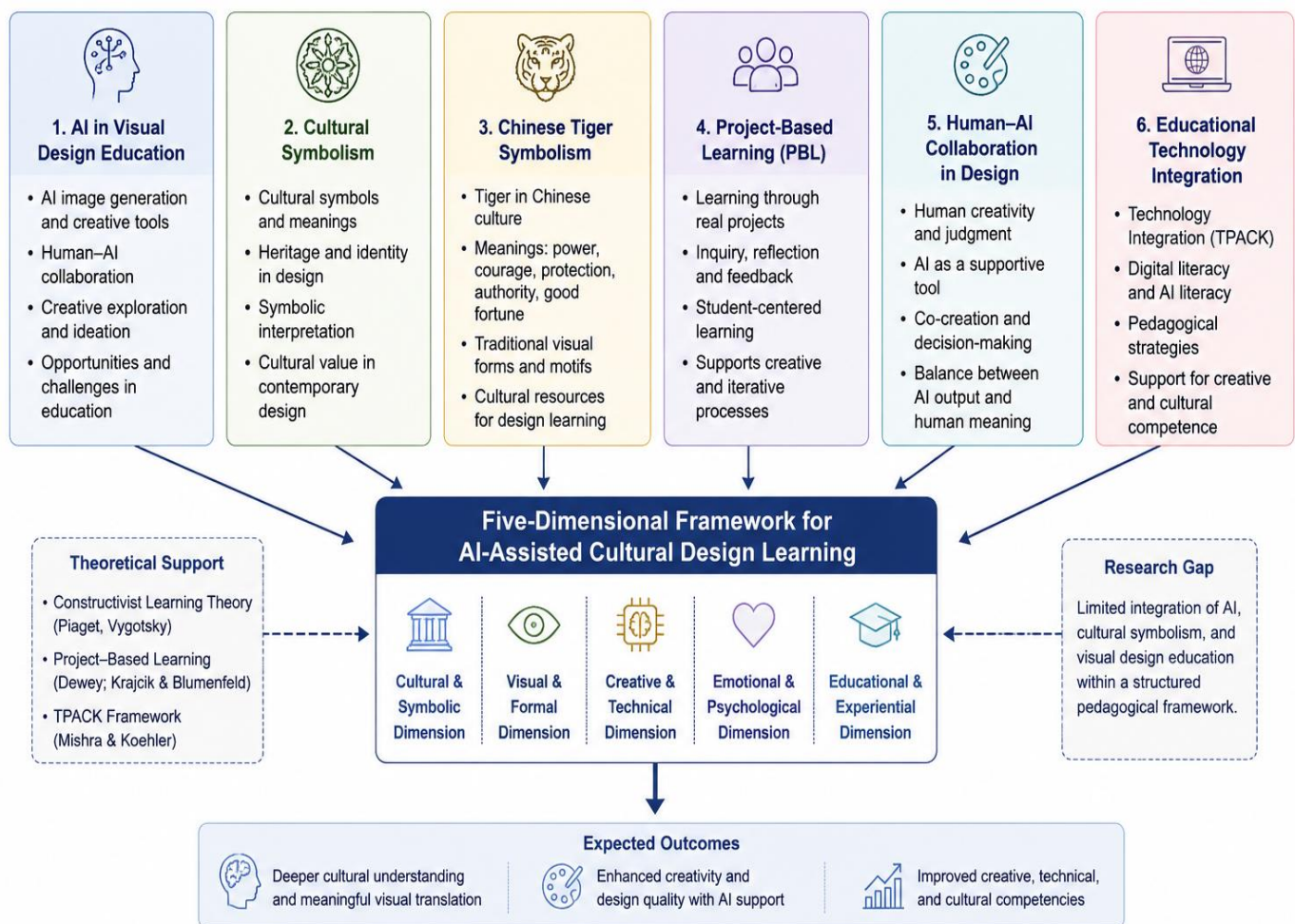


Figure 1. Literature-Based Conceptual Structure of the Study

As shown in Figure 1, the proposed five-dimensional framework is developed from six related literature areas. AI in visual design education provides the technical and creative background. Cultural symbolism and Chinese tiger symbolism provide the cultural content and visual resources. Project-based learning explains the classroom learning process. Human–AI collaboration explains the relationship between student creativity and AI support. Educational technology integration provides the pedagogical basis for using AI in teaching. Together, these areas indicate the need for a structured framework that connects cultural meaning, visual form, AI creation, emotional expression, and learning experience.

SUMMARY OF THE LITERATURE REVIEW

The literature shows that AI can support visual design education by helping students explore ideas, generate visual options, and develop creative works. However, AI use must be guided by teaching goals and cultural understanding. Cultural symbols, such as Chinese tiger imagery, provide rich resources for design learning, but they should not be used only as decoration. Project-based learning can support students in connecting cultural research, AI exploration, design practice, and reflection.

Based on these discussions, there is a need for a structured framework that connects AI tools, cultural symbolism, visual design practice, emotional expression, and student learning. The five-dimensional framework proposed in this study responds to this need. It provides a way to guide AI-assisted cultural design learning in visual design education and helps explain how Chinese tiger symbolism can support creative and meaningful design practice.

METHODOLOGY

Research Design

This study adopted a qualitative case study design to explore how a five-dimensional framework can support AI-assisted cultural design learning in visual design education. A qualitative approach was suitable because the study did not aim to measure students' design performance through numerical scores. Instead, it aimed to understand students' learning process, cultural interpretation, creative decision-making, and reflective experience when using AI tools for Chinese tiger-symbol visual design.

The case study design was selected because the research focused on one specific educational context: an AI-assisted visual design project based on Chinese tiger symbolism. This case allowed the researcher to examine how students understood cultural symbols, translated symbolic meanings into visual forms, used AI tools for creative exploration, and reflected on their learning outcomes. The case study approach also made it possible to collect rich and detailed data from different sources, including student design artefacts, reflection materials, interviews, expert feedback, and classroom observations.

The central focus of this study was not AI technology alone, but the pedagogical use of AI in a cultural design learning process. Therefore, the methodology was designed to connect classroom practice with framework development. The five-dimensional framework was used both as a teaching guide and as an analytical lens. It helped structure the learning activities and supported the later analysis of cultural meaning, visual form, AI-assisted creativity, emotional expression, and learning experience.

Research Context

The research was conducted in the context of visual design education in a Chinese higher education setting. The learning project focused on Chinese tiger symbolism as a cultural design theme. In this project, students were guided to explore the cultural meanings and visual forms of tiger imagery, and then use AI tools to support creative visual design development.

Chinese tiger symbolism was chosen because it carries strong cultural meanings in Chinese visual culture. The tiger is commonly associated with power, courage, protection, authority, vitality, and good fortune. It also has rich visual forms in folk art, traditional painting, decorative patterns, festival objects, and cultural products. These features made it suitable for a cultural visual design project supported by AI tools.

The classroom project was organized as an AI-assisted cultural design learning activity. Students first studied tiger-related cultural meanings and visual references. They then developed design ideas and used AI tools to generate visual possibilities. After that, they selected, revised, and refined their works based on teacher guidance,

peer discussion, and personal reflection. This process followed the logic of cultural interpretation, visual translation, AI generation, evaluation, and refinement.

Participants and Sampling

The participants included students, teachers, and experts. These three groups were selected because they represented different perspectives in the learning and evaluation process. Students provided data about learning experience, creative process, and design outcomes. Teachers provided data about classroom guidance, teaching process, and student development. Experts provided professional opinions on the framework, design quality, and educational value.

The student participants were undergraduate students involved in the AI-assisted tiger-symbol visual design project. The study used 24 student design artefacts and 24 student reflection materials. In addition, 16 students participated in semi-structured interviews. These student data helped reveal how learners understood tiger symbolism, used AI tools, made design decisions, and reflected on their learning process.

The teacher participants included 8 teachers. Their interviews focused on teaching design, classroom support, AI use, cultural guidance, and students' creative development. The expert participants included 3 experts. Their interviews focused on the validity, applicability, and educational value of the five-dimensional framework.

A purposive sampling strategy was used in this study. Participants were selected because they were directly related to the AI-assisted tiger-symbol design project and could provide relevant information. This sampling method was appropriate for a qualitative case study because the purpose was not statistical generalization, but deep understanding of a specific educational case.

Data Sources

This study used multiple data sources to support triangulation. The main data sources included student design artefacts, student reflection materials, student interviews, teacher interviews, expert interviews, and classroom observation notes.

Student design artefacts were used to analyse how Chinese tiger symbolism was visually translated in AI-assisted design works. These artefacts showed how students used tiger forms, patterns, colors, composition, symbolic elements, and AI-generated visual outputs in their final designs.

Student reflection materials were used to understand students' thinking process. These reflections helped explain why students chose certain tiger elements, how they used AI tools, what problems they met, and how they revised their works.

Student interviews provided deeper information about learning experience, AI use, cultural understanding, creative choices, and perceived learning outcomes. Teacher interviews provided another perspective on the classroom process, student performance, and the role of teaching support. Expert interviews were used to examine the professional and educational value of the five-dimensional framework.

Classroom observation notes were also included. These notes helped record students' learning behavior, classroom interaction, teacher guidance, and the use of AI tools during the design process. Together, these data sources provided a more complete view of AI-assisted cultural design learning.

This study used multiple data sources to understand AI-assisted cultural design learning from different perspectives. Student data were used to examine learning experience, creative process, and design outcomes.

Teacher and expert data were used to support pedagogical interpretation and framework validation. Table 1 summarizes the main data sources, sample size, and analytical focus of the study.

Table 1: Data Sources and Analytical Focus

Data Source	Number	Analytical Focus
Student design artefacts	24	Visual translation, cultural symbols, AI-supported design outcomes
Student reflection materials	24	Learning experience, reflection, design decision-making
Student interviews	16	Cultural understanding, AI use, creative process
Teacher interviews	8	Teaching support, student development, framework use
Expert interviews	3	Framework validation, applicability, design quality
Classroom observations	Included	Classroom process, interaction, AI use

As shown in Table 1, each data source had a specific analytical role. Student artefacts were mainly used to examine visual translation and design outcomes, while reflection materials and interviews were used to understand learning experience, AI use, and design decision-making. Teacher and expert interviews provided additional perspectives on teaching support, framework applicability, and research trustworthiness.

Data Collection Procedure

The data collection process was organized in several stages.

The first stage was project preparation. The researcher reviewed literature related to AI in visual design education, cultural symbolism, Chinese tiger imagery, project-based learning, human–AI collaboration, and educational technology integration. Based on this preparation, the AI-assisted tiger-symbol design project and related learning activities were designed.

The second stage was cultural and visual exploration. Students were guided to study Chinese tiger symbolism, including its cultural meanings and visual features. They examined traditional and contemporary tiger images and discussed how tiger symbolism could be transformed into visual design language.

The third stage was AI-assisted design practice. Students used AI tools to generate tiger-themed visual design ideas. They developed prompts, tested different visual styles, compared outputs, and selected suitable results. During this stage, students were encouraged not to accept AI outputs directly, but to evaluate and revise them based on cultural meaning, visual quality, and design purpose.

The fourth stage was reflection and feedback. Students received teacher feedback and engaged in revision. They also wrote reflection materials to explain their design choices, AI use, problems, and learning outcomes.

The fifth stage was interview collection. Semi-structured interviews were conducted with students, teachers, and experts. Student interviews focused on cultural understanding, AI-assisted creativity, design decision-making, and learning experience. Teacher interviews focused on teaching process, classroom guidance, and student development. Expert interviews focused on framework validation and educational applicability.

The overall research procedure was organized from research design to data collection and data analysis. The process began with the qualitative case study design and continued through project preparation, cultural exploration, AI-assisted design practice, reflection, interviews, and analysis. Figure 2 presents the complete research design and data analysis process.

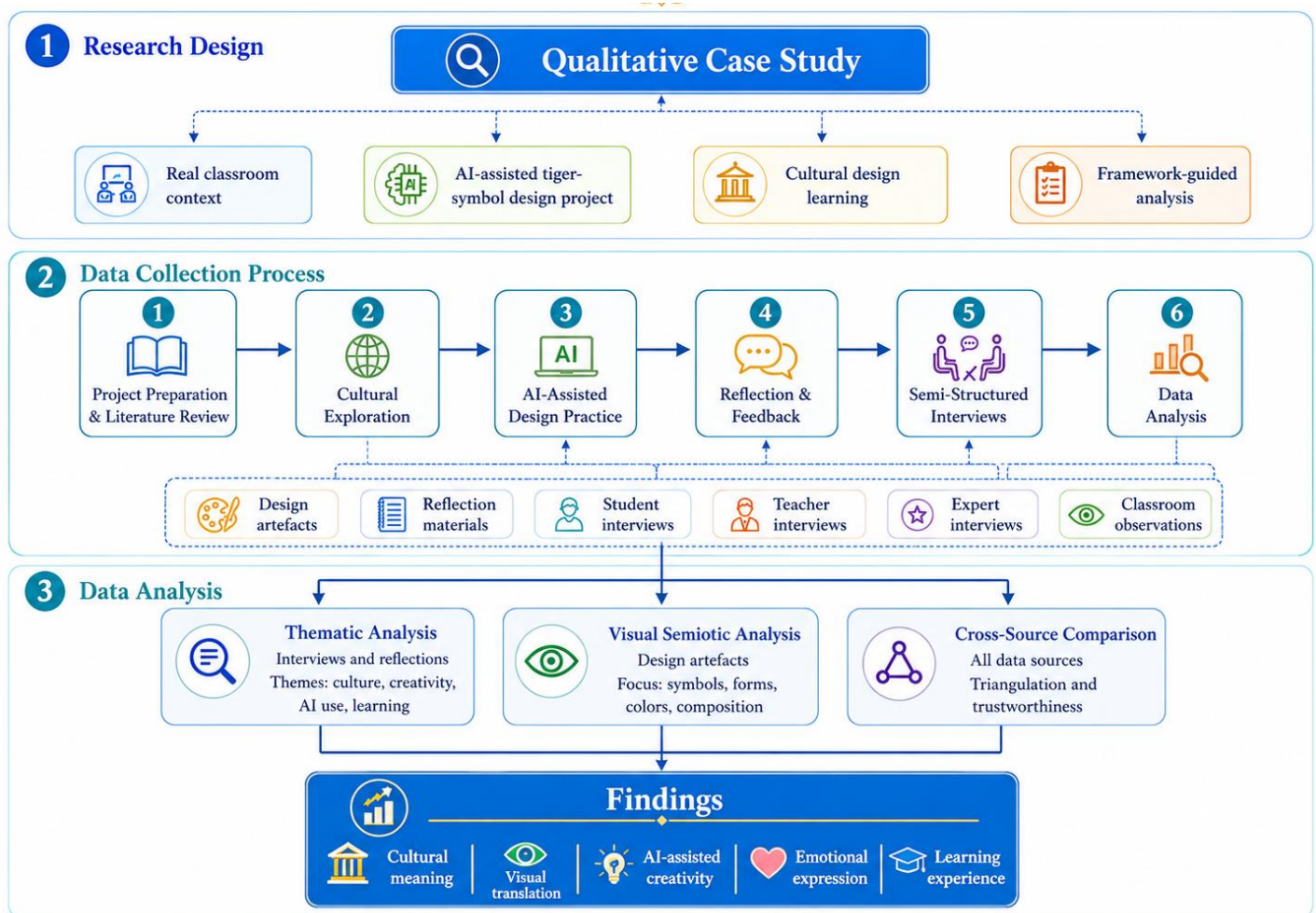


Figure 2. Research Design and Data Analysis Process

As shown in Figure 2, the study followed a qualitative case study design and used multiple data sources, including design artefacts, reflection materials, interviews, and classroom observations. The collected data were analysed through thematic analysis, visual semiotic analysis, and cross-source comparison. These methods supported the development of findings related to cultural meaning, visual translation, AI-assisted creativity, emotional expression, and learning experience.

Research Instruments

The main research instruments included semi-structured interview protocols, an artefact analysis guide, a reflection prompt guide, and classroom observation notes.

Semi-structured interviews were used because they provided both structure and flexibility. The researcher prepared guiding questions in advance, but could also ask follow-up questions according to participants' answers. This was useful for understanding students' real experiences and teachers' professional observations.

The student interview protocol included questions about students' understanding of Chinese tiger symbolism, their use of AI tools, their design process, their creative decisions, and their reflections on learning. The teacher interview protocol included questions about teaching support, student engagement, AI use in class, and the value of the framework. The expert interview protocol focused on the clarity, usefulness, and possible improvement of the five-dimensional framework.

The artefact analysis guide was based on the five dimensions of the framework. It helped analyse cultural

meaning, visual form, AI-supported creativity, emotional expression, and educational value in student design works. The reflection prompt guide encouraged students to explain their process in simple but meaningful ways.

Data Analysis

The data were analysed through thematic analysis, visual semiotic analysis, and cross-source comparison.

Thematic analysis was used to analyse interview data and reflection materials. The researcher read the data repeatedly, identified key meanings, coded important statements, and grouped similar codes into themes. The themes were related to cultural understanding, visual translation, AI use, creativity, originality, emotional expression, teacher guidance, and learning reflection.

Visual semiotic analysis was used to analyse student design artefacts. This analysis focused on how tiger symbolism was represented through visual elements. These elements included tiger shapes, stripes, facial expression, body posture, color, pattern, composition, style, and symbolic association. The analysis also considered whether the design communicated cultural meanings such as strength, protection, courage, authority, or good fortune.

Cross-source comparison was used to strengthen the findings. The researcher compared evidence from student artefacts, student reflections, interviews, teacher feedback, expert opinions, and classroom observations. For example, if a theme appeared in student reflections and was also supported by teacher interviews and artefact analysis, it was considered more credible.

The five-dimensional framework guided the analysis. The cultural and symbolic dimension was used to examine cultural meaning. The visual and formal dimension was used to analyse visual translation. The creative and technical dimension was used to study AI prompt design, generation, and human–AI decision-making. The emotional and psychological dimension was used to analyse emotional expression. The educational and experiential dimension was used to examine student learning, reflection, and competence development.

Trustworthiness

Several strategies were used to improve trustworthiness. First, data triangulation was applied by using multiple data sources, including artefacts, reflections, interviews, observation notes, and expert feedback. This helped reduce dependence on a single type of evidence.

Second, cross-source comparison was used to check consistency among different data. Findings were not based only on one participant group. Student, teacher, and expert perspectives were compared to form a more balanced interpretation.

Third, the use of the five-dimensional framework provided a clear analytical structure. This helped make the analysis more organized and transparent. It also ensured that cultural, visual, technical, emotional, and educational aspects were all considered.

Fourth, representative examples from student works and reflections were used to support the interpretation. These examples helped connect the findings with actual learning and design evidence.

Ethical Considerations

Ethical issues were considered throughout the research process. Participants were informed about the purpose of the study and the use of collected data. Participation was voluntary. The researcher protected the privacy of participants and avoided using real names in the reporting process.

Student works, reflections, and interview data were used only for academic research. The data were handled carefully to avoid misuse. When reporting findings, the researcher focused on learning process and design analysis rather than personal evaluation of individual students.

Methodological Limitations

This methodology also has some limitations. First, the study was conducted in one educational context, so the findings cannot represent all visual design programs or all universities. Second, the study used a qualitative case study design, so it focused on depth rather than large-scale statistical generalization. Third, the data were based on a specific cultural theme, Chinese tiger symbolism. Therefore, the framework may need further testing with other cultural symbols and in other educational contexts.

Despite these limitations, the methodology is suitable for the purpose of this study. It provides rich evidence about how AI-assisted cultural design learning happens in a real classroom project. It also helps explain how the five-dimensional framework can guide and analyse students' cultural understanding, visual design practice, AI use, emotional expression, and learning experience.

FINDINGS

This section presents the findings of the study. The findings are organized around the five-dimensional framework for AI-assisted cultural design learning. The analysis shows how students used Chinese tiger symbolism in visual design, how AI supported their creative process, and how the framework helped connect cultural meaning, visual form, technical exploration, emotional expression, and learning experience.

Cultural and Symbolic Understanding of Chinese Tiger Imagery

The first finding shows that the five-dimensional framework helped students move from a general understanding of tiger images to a deeper cultural interpretation of Chinese tiger symbolism. At the beginning of the project, many students mainly understood the tiger as a strong animal image. Their early ideas often focused on obvious visual features, such as tiger stripes, sharp eyes, strong body shape, and orange or black color. These elements were useful, but they were still close to surface-level visual recognition.

After the cultural exploration stage, students began to understand the tiger as a cultural symbol. They connected tiger imagery with meanings such as power, courage, protection, authority, vitality, and good fortune. This change was important because it influenced their design direction. Instead of only asking AI to generate "a tiger picture," students began to think about what kind of tiger meaning they wanted to express. For example, some students used the tiger to express protection and guardianship, while others used it to express strength, bravery, or cultural identity.

This finding suggests that cultural understanding became a starting point for AI-assisted design. The cultural and symbolic dimension helped students clarify the meaning behind the design before they moved into visual production. In this way, the tiger was not treated only as a decorative image. It became a meaningful cultural resource for design learning.

Visual Translation from Cultural Meaning to Design Form

The second finding shows that students gradually learned to translate cultural meanings into visual forms. The visual and formal dimension of the framework guided students to think about how tiger symbolism could be represented through lines, patterns, colors, composition, texture, and style.

In student design artefacts, tiger symbolism was expressed in different ways. Some students used tiger stripes as repeated patterns to create rhythm and visual identity. Some students emphasized tiger eyes to show power and authority. Others used traditional Chinese visual elements, such as clouds, mountains, ink-wash textures, or folk-style patterns, to strengthen the cultural feeling of their works. These design choices show that students were not only using tiger images directly, but also transforming tiger-related meanings into visual language.

However, the findings also show that visual translation was not always easy. Some early AI-generated images looked visually attractive but did not clearly express Chinese cultural meaning. In some cases, the tiger appeared too fantasy-like, too cartoon-like, or too close to general digital illustration. These problems required students to return to cultural references and adjust their design direction. This process shows that visual translation needs both cultural knowledge and design judgment.

Therefore, the visual and formal dimension played an important role in connecting meaning and form. It helped students understand that a culturally meaningful design should not only look good, but also communicate symbolic meaning clearly.

AI-Assisted Creative and Technical Exploration

The third finding is related to the creative and technical dimension. AI tools supported students' creative exploration by helping them generate multiple visual possibilities in a short time. Through prompt writing, image generation, style testing, and repeated revision, students were able to explore more design directions than they could through manual sketching alone.

The findings show that AI helped students in three main ways. First, AI expanded visual possibilities. Students could quickly see different versions of tiger imagery, such as realistic, ink-style, decorative, modern, symbolic, or hybrid forms. Second, AI supported idea development. Some students used AI outputs as inspiration and then refined them based on their own design aims. Third, AI made the design process more iterative. Students could adjust prompts, compare results, and improve visual effects through repeated generation.

At the same time, the findings also show that AI did not automatically create high-quality design. The quality of the design still depended on students' decisions. Students needed to write meaningful prompts, select useful outputs, reject unsuitable images, and revise visual details. In some cases, AI produced images that were visually rich but culturally unclear. In other cases, AI outputs included inaccurate forms, weak composition, or over-stylized effects. Students had to use their own judgment to correct these problems.

This finding supports the idea that AI should be understood as a creative partner rather than a replacement for students. The creative value of AI-assisted design came from the interaction between AI generation and human decision-making. Students' originality was shown not only in the final image, but also in how they guided, selected, revised, and explained the design.

Emotional and Psychological Expression in Tiger-Themed Design

The fourth finding shows that emotional expression became an important part of students' design process. The emotional and psychological dimension helped students think about what feeling their tiger-themed designs should communicate to viewers.

Different students used tiger imagery to express different emotional qualities. Some works emphasized authority and strength through strong posture, sharp eyes, dark colors, and bold composition. Some works expressed protection and guardianship by combining tiger imagery with calm colors, stable composition, or symbolic cultural elements. Other works explored affinity, mystery, or vitality through softer visual styles, decorative

patterns, or imaginative forms.

This finding shows that tiger symbolism has emotional flexibility. It can express not only power and aggression, but also protection, warmth, dignity, and cultural pride. The framework helped students notice this emotional range. It also encouraged them to think about whether the AI-generated image matched the intended emotional meaning.

However, emotional mismatch also appeared in some designs. For example, some students wanted to express protection, but the AI output looked too aggressive. Some wanted to express cultural dignity, but the image became too playful or commercial. These cases showed that emotional expression required careful evaluation. Students needed to adjust visual elements, change prompts, or revise the final design to make the emotional message clearer.

Therefore, the emotional and psychological dimension strengthened the quality of AI-assisted cultural design. It reminded students that cultural design should not only present symbols, but also communicate feeling and meaning.

Educational and Experiential Value of the Framework

The fifth finding shows that the framework supported students' learning experience. The educational and experiential dimension helped students reflect on what they learned from the project, including cultural understanding, AI use, creative thinking, and visual design ability.

Student reflections and interviews showed that the project helped them understand the relationship between traditional culture and contemporary design. Many students realized that cultural symbols cannot be used only as decorative elements. They need to be studied, interpreted, and transformed. Students also learned that AI can support creativity, but it cannot replace human thinking. They needed to guide AI with clear design goals and cultural understanding.

The framework also helped organize the learning process. Students could follow a clearer path: understand cultural meaning, translate meaning into visual form, use AI to generate possibilities, evaluate emotional and visual quality, and revise the work through reflection. This process made AI use more meaningful and less random.

Teachers also played an important role in this process. Teacher guidance helped students avoid superficial use of tiger imagery and over-dependence on AI. Teachers encouraged students to explain their design ideas, compare AI outputs, and refine their works. Expert feedback also supported the value of the framework, especially in terms of its clarity, educational use, and possible application in cultural design courses.

This finding suggests that the five-dimensional framework can be used not only as an analytical model, but also as a teaching guide. It supports students' creative, technical, and cultural competencies by linking design practice with reflection and cultural learning.

Integrated Finding: How the Five Dimensions Work Together

The overall finding is that the five dimensions are not separate. They work together as an iterative learning process. Cultural meaning provides the starting point. Visual form turns meaning into design language. AI supports creative and technical exploration. Emotional expression helps students judge the effect of the design.

Educational reflection helps students understand and improve their learning.

The process is not linear. Students often moved back and forth among the dimensions. For example, when an AI output did not express the intended cultural meaning, students returned to the cultural and symbolic dimension. When the visual form was weak, they adjusted patterns, colors, or composition. When the emotional tone was not clear, they revised the prompt or selected another image. This repeated process helped students develop stronger design awareness.

The findings also show that AI-assisted cultural design learning becomes meaningful only when AI is guided by cultural interpretation and human judgment. AI can provide visual possibilities, but students and teachers need to decide which possibilities are culturally suitable, visually effective, and educationally valuable.

In this study, Chinese tiger symbolism served as a bridge between tradition and digital design. It helped students connect cultural heritage with AI-assisted creative practice. The five-dimensional framework provided a structure for this connection. It showed how cultural symbols can be understood, translated, generated, evaluated, and refined in visual design education.

Overall, the findings suggest that the five-dimensional framework can support AI-assisted cultural design learning in three ways. First, it helps students deepen cultural understanding. Second, it guides students to transform cultural meaning into visual and emotional expression. Third, it supports creative learning through AI exploration, teacher guidance, and reflection. Therefore, the framework provides a useful model for integrating AI, cultural heritage, and visual design education.

The five findings indicate that AI-assisted cultural design learning is not formed by one single factor. Instead, it emerges from the interaction among cultural understanding, visual translation, AI-supported exploration, emotional expression, and reflective learning. Figure 3 summarizes these integrated findings based on the five-dimensional framework.

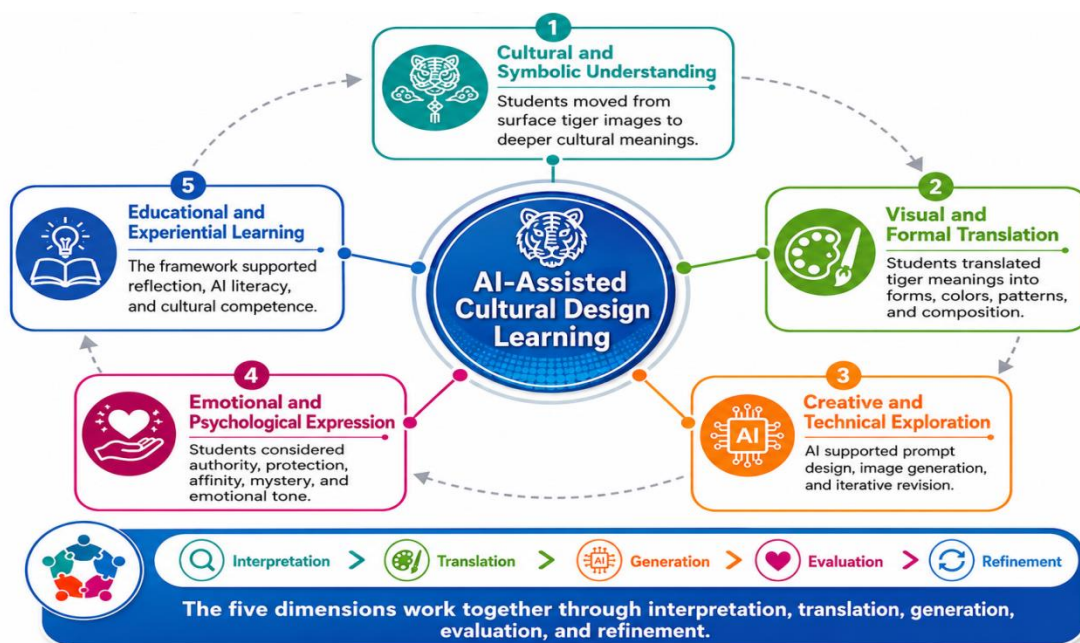


Figure 3. Integrated Findings Based on the Five-Dimensional Framework

As shown in Figure 3, the five dimensions work together through an iterative process of interpretation, translation, generation, evaluation, and refinement. Cultural and symbolic understanding provides the starting

point for design learning. Visual and formal translation helps students turn cultural meanings into design language. Creative and technical exploration shows how AI supports prompt design, image generation, and revision. Emotional and psychological expression helps students judge whether the design communicates the intended feeling. Educational and experiential learning supports reflection, AI literacy, and cultural competence. Together, these findings show that AI-assisted cultural design learning becomes meaningful when AI use is guided by cultural meaning, human judgment, and pedagogical reflection.

To further clarify the relationship between the five dimensions, the main findings, and the supporting evidence, Table 2 summarizes how each dimension of the framework was reflected in the data. The table also shows the main data sources used to support each finding.

Table 2. Summary of Findings and Supporting Evidence

Dimension	Main Finding	Supporting Evidence
Cultural and Symbolic Dimension	Students developed a deeper understanding of Chinese tiger symbolism, moving from surface images to cultural meanings.	Student reflections; student interviews
Visual and Formal Dimension	Students translated tiger meanings into visual forms, including patterns, colors, composition, and stylistic choices.	Student design artefacts; visual semiotic analysis
Creative and Technical Dimension	AI supported prompt design, image generation, visual exploration, and iterative revision.	Student artefacts; student interviews; teacher feedback
Emotional and Psychological Dimension	Students adjusted visual tone to express protection, power, affinity, mystery, and emotional meaning.	Design artefacts; reflection materials
Educational and Experiential Dimension	The framework supported reflection, AI literacy, creative competence, and cultural competence.	Student reflections; teacher interviews; expert feedback

As summarized in Table 2, the findings were supported by multiple data sources rather than a single type of evidence. Student artefacts showed the visual outcomes of AI-assisted cultural design learning, while reflections and interviews explained the learning process behind these outcomes. Teacher and expert feedback further supported the educational value and applicability of the five-dimensional framework. Overall, the evidence suggests that the framework can help students connect cultural understanding, AI-supported creativity, emotional expression, and reflective learning in visual design education.

DISCUSSION

This study proposed and examined a five-dimensional framework for AI-assisted cultural design learning in visual design education. The findings show that AI can support students' creative exploration, but its educational value depends on how it is guided by cultural understanding, design thinking, emotional judgment, and reflective learning. In this study, Chinese tiger symbolism provided a cultural case through which students could connect traditional meanings with contemporary AI-assisted visual design practice. The discussion below explains the main meanings of these findings.

AI-Assisted Design Learning Needs Cultural Grounding

One important finding is that cultural understanding must come before AI generation. In the early stage of the project, some students tended to see the tiger mainly as a visual image. They focused on strong body shapes, stripes, eyes, or colors. These visual features were useful, but they did not fully show the cultural meaning of the tiger. After cultural exploration, students began to understand the tiger as a symbol of power, courage, protection, authority, vitality, and good fortune. This deeper understanding helped them create more meaningful visual directions.

This finding suggests that AI-assisted design education should not begin only with technical operation. If students use AI without cultural grounding, they may produce images that look attractive but have weak meaning. In cultural design learning, students need to ask what the symbol means before asking AI to generate images. Therefore, the cultural and symbolic dimension is not an extra part of the framework. It is the foundation of the whole design process.

This also changes the role of AI in design education. AI is not only a fast image-making tool. It can become a learning support tool when students use it after cultural research and design thinking. In this way, AI can help students test how cultural meanings may appear in different visual forms. However, the meaning still needs to come from human interpretation.

Visual Translation Connects Culture and Design Practice

The findings also show that cultural meaning must be translated into visual language. Students did not only need to know that the tiger means strength or protection. They also needed to decide how these meanings could be shown through shape, line, color, pattern, texture, and composition. This is the function of the visual and formal dimension.

This point is important because cultural design can easily become superficial. Students may add traditional patterns or tiger images to a design without clear visual logic. The framework helped students understand that design is a process of transformation. A cultural idea must become a visual form. For example, tiger stripes may become rhythmic patterns, tiger eyes may express authority, and traditional cloud or mountain elements may create a stronger Chinese cultural atmosphere.

The findings show that AI sometimes made this process easier by generating different visual options. However, AI also created problems. Some outputs were too fantasy-like, too cartoon-like, or not culturally specific enough. This means that AI output still needs human selection and visual judgment. Visual translation is therefore not only about generating images. It is about checking whether the image communicates the intended cultural meaning.

Human Judgment Remains Central in Human–AI Co-Creation

The study confirms that human judgment remains central in AI-assisted design. AI helped students produce many visual possibilities quickly. It supported prompt testing, style exploration, and iterative revision. However, the findings show that originality did not simply come from AI. It came from how students guided the AI, selected useful results, revised weak parts, and explained their design choices.

This finding is important for understanding human–AI co-creation in education. In a learning context, AI should not replace the student's role as a designer. Instead, it should create a space for students to compare, decide, and improve. The student's creative agency appears in the whole process: choosing cultural meanings, writing prompts, judging images, revising results, and reflecting on design decisions.

Therefore, AI-assisted design learning should be evaluated not only by the final image, but also by the student's

process. A visually strong AI-generated image may not be a strong learning outcome if the student cannot explain its meaning or design logic. By contrast, a design with visible revision and clear cultural intention may show stronger learning value. This supports the need to include process evidence, such as reflections and interviews, in AI design education research.

Emotional Expression Strengthens Cultural Design Quality

Another important finding is that emotional expression affects the quality of cultural design. Tiger symbolism is emotionally rich. It can express authority, protection, courage, mystery, vitality, and affinity. The emotional and psychological dimension helped students think about what feeling their design should communicate.

This is important because cultural symbols are not only visual signs. They also produce emotional responses. A tiger image may look powerful, but it may also seem aggressive or distant. A student who wants to express protection must control the emotional tone carefully. The design should not only show a tiger; it should show the right type of tiger meaning.

The findings show that emotional mismatch appeared in some AI outputs. For example, an image intended to show guardianship could become too aggressive. An image intended to show cultural dignity could become too playful. These cases show why students need to evaluate AI outputs emotionally and culturally. Emotional expression is therefore part of design judgment. It helps students decide whether a visual result is suitable for the cultural message.

The Framework Supports Reflective and Competency-Based Learning

The educational and experiential dimension shows that the framework supported student learning beyond image production. Students learned about culture, visual design, AI operation, prompt design, evaluation, and revision. More importantly, they learned that AI use should be guided by intention and reflection.

The framework gave students a clear learning path. They could move from cultural interpretation to visual translation, then to AI generation, evaluation, and refinement. This helped reduce random AI use. It also helped teachers guide students more effectively. Teachers could ask students not only whether the image looked good, but also whether it had cultural meaning, visual clarity, emotional accuracy, and learning value.

This finding suggests that the five-dimensional framework can be used as both a teaching guide and an analytical tool. As a teaching guide, it helps structure classroom activities. As an analytical tool, it helps researchers examine different parts of AI-assisted cultural design learning. This dual function is one of the main contributions of the study.

Implications for Visual Design Education

The findings have several implications for visual design education. First, teachers should not introduce AI tools only as technical software. AI tasks should be connected with cultural research, design goals, and reflective activities. Second, cultural symbols should be taught as meaningful resources, not just decorative materials. Third, students should be trained to evaluate AI outputs critically. They need to judge cultural accuracy, visual quality, emotional tone, and originality.

The study also suggests that AI-assisted design education should include process-based assessment. Teachers can assess not only final images, but also students' cultural research, prompt development, design revisions, and reflective explanations. This can help students understand that creative design is not only about results, but also about thinking and learning.

For curriculum development, the framework may help art and design programs integrate AI with cultural heritage education. It provides a practical structure for designing cultural creative projects using AI. Although the study focused on Chinese tiger symbolism, the framework may also be adapted to other cultural symbols, such as dragons, phoenixes, traditional patterns, local heritage objects, or regional visual culture.

LIMITATIONS OF THE DISCUSSION

The discussion should also be understood within the limits of the study. The study was based on one visual design education context and one cultural case. Therefore, the findings cannot be generalized to all design programs. The framework was examined through qualitative data, so it explains learning processes in depth but does not provide statistical measurement. Future studies may test the framework in other universities, other cultural themes, or mixed-method research designs.

Overall, the discussion shows that AI-assisted cultural design learning becomes meaningful when AI is placed inside a clear pedagogical and cultural structure. The five-dimensional framework helps explain this structure. It shows that students need cultural understanding, visual translation, technical exploration, emotional judgment, and reflective learning. In this sense, the value of AI in visual design education is not only in what it can generate, but in how it can support students to think, create, judge, and learn.

CONCLUSION

This study proposed a five-dimensional framework for AI-assisted cultural design learning in visual design education, using Chinese tiger symbolism as the case. The framework includes five connected dimensions: cultural and symbolic, visual and formal, creative and technical, emotional and psychological, and educational and experiential. These dimensions explain how students understand cultural meaning, translate it into visual form, use AI tools for creative exploration, express emotional meaning, and reflect on their learning process.

The findings show that AI can support visual design education, but its value does not come only from fast image generation. AI becomes meaningful when it is guided by cultural understanding, human judgment, teacher support, and reflective learning. In this study, Chinese tiger symbolism helped students move beyond surface-level image use and develop deeper cultural awareness. It also provided rich visual resources for students to explore form, pattern, color, composition, and symbolic expression.

The study also shows that human–AI co-creation is an important part of cultural design learning. AI helped students generate different visual possibilities, but students still needed to write prompts, select outputs, revise designs, and judge cultural and emotional quality. Therefore, originality and creativity were not produced by AI alone. They were developed through the interaction between AI support and human decision-making.

This research contributes to visual design education by offering a structured framework for integrating AI tools with cultural symbol learning. It also provides practical guidance for teachers who want to use AI in cultural and creative design courses. The framework can help teachers organize learning activities, guide students' design process, and evaluate both final works and learning experiences.

However, this study has limitations. It was based on one educational context and one cultural case, so the findings cannot represent all design programs. Future research can test the framework in different universities, different cultural themes, and broader learning settings. Mixed-method studies may also be used to examine students' learning outcomes more deeply. Overall, the study argues that AI-assisted cultural design learning should not only focus on what AI can generate, but also on how students understand, create, evaluate, and learn

through AI-supported design practice.

REFERENCES

1. Boden, M. A. (2004). *The creative mind: Myths and mechanisms* (2nd ed.). Routledge.
2. Brown, T. (2008). Design thinking. *Harvard Business Review*, 86(6), 84–92.
3. Chiou, L. Y., Hung, P. K., Liang, R. H., & Wang, C. T. (2023). Designing with AI: An exploration of co-ideation with image generators. In *Proceedings of the 2023 ACM Designing Interactive Systems Conference* (pp. 1941–1954). ACM. doi:10.1145/3563657.3596001
4. Dewey, J. (1938). *Experience and education*. Macmillan.
5. Eberhard, W. (1986). *A dictionary of Chinese symbols: Hidden symbols in Chinese life and thought*. Routledge.
6. Gay, G. (2018). *Culturally responsive teaching: Theory, research, and practice* (3rd ed.). Teachers College Press.
7. Jewitt, C., Bezemer, J., & O'Halloran, K. (2016). *Introducing multimodality*. Routledge.
8. Krajcik, J. S., & Blumenfeld, P. C. (2006). Project-based learning. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (pp. 317–334). Cambridge University Press.
9. Kress, G. (2010). *Multimodality: A social semiotic approach to contemporary communication*. Routledge.
10. Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal*, 32(3), 465–491. doi:10.3102/00028312032003465
11. Manovich, L. (2001). *The language of new media*. MIT Press.
12. Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017–1054. doi:10.1111/j.1467-9620.2006.00684.x
13. Norman, D. A. (2013). *The design of everyday things* (Rev. and expanded ed.). Basic Books.
14. Shneiderman, B. (2020). Human-centered artificial intelligence: Reliable, safe & trustworthy. *International Journal of Human–Computer Interaction*, 36(6), 495–504. doi:10.1080/10447318.2020.1741118
15. Thomas, J. W. (2000). *A review of research on project-based learning*. Autodesk Foundation.
16. Welch, P. B. (2008). *Chinese art: A guide to motifs and visual imagery*. Tuttle Publishing.