



Revitalizing Chinese Bronze Mirror Patterns: Educational Integration and Traditional Skill Innovation

Linjing Dang¹ and Yodkwan Sawatdee²

Faculty of Decorative Arts, Silpakorn University, Thailand

¹E-mail: danglinjing1@gmail.com, ORCID ID: <https://orcid.org/0009-0001-5147-1860>

²E-mail: tonyodkwan@gmail.com, ORCID ID: <https://orcid.org/0009-0007-4961-5785>

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Abstract

Background and Aim: Chinese bronze mirrors represent a distinctive cultural heritage spanning multiple dynasties, with patterns embodying cosmological beliefs, social values, and aesthetic principles. The carving and chiseling techniques developed over centuries demonstrate exceptional craftsmanship and cultural symbolism. Despite this rich heritage, contemporary art education has increasingly marginalized these traditional craft elements, endangering both technical knowledge and cultural understanding. This research therefore aims to: 1) To identify and categorize the artistic educational values of Chinese bronze mirror decorative patterns through analysis of historical specimens; 2) To analyze how to integrate traditional Chinese carving techniques into the modern art design education system for design innovation; 3) To document, systematize, and evaluate approaches for the sustainable inheritance and innovative development of traditional Chinese bronze mirror carving techniques.

Materials and Methods: This research uses qualitative research methods, including documentary analysis of historical texts and publications, and field research at Tianyichang Bronze Sculpture Center in Datong, Shanxi Province, China. The process includes structured interviews with craft inheritors, participation in the traditional carving and chiseling production process, documentation through photography and video, and discussions on the feasibility of teaching experiments in art education environments.

Results: The research identified five main educational values of bronze mirror patterns: cultural heritage, craftsmanship, skill development, aesthetic improvement, and creative thinking. The study found that four types of traditional patterns are beneficial for integration into contemporary art and design education. The study proposed a fusion idea that has not appeared in the literature before, providing an educational model to protect endangered traditional skills and promote innovation.

Conclusion: This research establishes a framework for integrating traditional bronze mirror craftsmanship into contemporary art education, promoting preservation and innovation. The findings demonstrate that such integration enhances students' cultural literacy and innovative capacity, ensuring the continuation of valuable traditional knowledge. These insights are valuable for art educators and cultural heritage professionals.

Keywords: Chinese Bronze Mirror Patterns; Art Education; Traditional Skills; Inheritance and Innovation

Introduction

Chinese bronze mirrors represent one of the most important forms of sculptural art in Chinese cultural history, spanning over 3,500 years from the Shang Dynasty to the Qing Dynasty. These artifacts served not merely as practical implements for reflection but as complex cultural repositories embodying artistic excellence, technical craftsmanship, and symbolic meaning. Their decorative patterns evolved to reflect changing aesthetic sensibilities, philosophical concepts, and social values across dynasties, making them invaluable records of Chinese cultural development (Zhang, 2024). As repositories of traditional design principles and technical skills, bronze mirrors offer particularly rich resources for contemporary art education and cultural heritage preservation.

In ancient Chinese history and culture, mirrors were regarded as a symbol of the rise and fall of a country. Emperor Taizong of Tang said, "Using bronze as a mirror, one can correct one's clothes and hats; using history as a mirror, one can understand the rise and fall; using people as a mirror, one can understand gains and losses." In addition, the ancients cast beautiful poems on the back of mirrors and painted beauties looking at mirrors as masterpieces (Yang, 2020). For example, the "Admonitions of the Instructress to Court Ladies" by Gu Kaizhi, a famous painter in the Eastern Jin Dynasty, is considered to be one of the earliest dressing pictures. The "Looking at the Mirror and Dressing" part of the painting depicts two kneeling women: one woman kneels in front of a bronze mirror with a mirror frame, and the maid beside her combs



her hair; the other woman has her back to the picture, holding a bronze mirror and dressing, and her face is reflected in the mirror. This painting expresses women's gaze and reflection on themselves, and is full of profound philosophical thoughts. Graphic art and bronze mirrors are mutually connected and become eternal. The symbolic meanings of different patterns are different. For example, the dragon and phoenix patterns symbolize power and expectation; the fish patterns popular in the Jin Dynasty symbolize wealth; the bronze mirrors with flower and bird patterns in the Song Dynasty symbolize the ancient people's yearning for nature and simplicity; the Bagua patterns and swastika patterns symbolize religious ideas. The ancients turned bronze mirrors into art, incorporating the rise and fall of a country, political ideas, life dreams, and the love between young men and women into bronze mirrors(Gu, 2011).



Figure 1 The "Mirror and Makeup" section of "Admonitions of the Instructress to Court Ladies"

Note: Baidu Encyclopedia

Despite their cultural and artistic significance, Chinese bronze mirror patterns and their associated craftsmanship have been increasingly marginalized in contemporary art and design education (Zhang, 2024). A survey of leading art and design courses in 20 schools in China showed that only 2% of the courses included content related to traditional bronze mirror carving techniques, and there were very few master craftsmen specializing in these techniques. The inheritors of many intangible cultural heritage projects are aging. According to data from 2022, the proportion of inheritors over 70 years old is as high as 71%. This poses a challenge to the continued inheritance and development of traditional crafts such as carving techniques. This situation not only the preservation of intangible cultural heritage but also deprives modern design students of valuable aesthetic traditions and technical approaches that could enrich contemporary design practices (Mei, 2019). The disconnection between traditional craftsmanship and modern design education represents a significant loss of cultural and educational resources.

This research is located at the intersection of multiple theoretical frameworks and explores the role of bronze mirror carving and chiseling skills learning in art education. First, the learning theory based on carving and chiseling skills emphasizes the importance of hands-on practice and experience in construction. In design education, this approach can promote students' in-depth understanding and innovative application of traditional skills (Zou, 2015). In addition, the experiential learning theory proposed by David A. Kolb also supports deepening the mastery of decorative pattern art culture through practice. In terms of the cultural heritage protection framework, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) Convention for the Safeguarding of the Intangible Cultural Heritage emphasizes that the protection and dissemination of traditional skills through education and training systems is an important strategy for intangible cultural heritage inheritance. In addition, referring to the existing design education model can provide ideas for the integration of traditional crafts. In recent years, the research of Mei (2019) and Zou (2015) also showed that introducing the teaching model of traditional crafts in design courses can effectively enhance students' cultural understanding and creativity, although these studies mainly focus on paper cutting and embroidery rather than bronze mirror carving. Finally, in the field of



educational research, there have been many studies on the application of traditional crafts in education. For example, Yang (2020) explored the impact of craft training on design thinking, while Zhang (2024) analyzed the practice of traditional Chinese skills in art and design courses. These studies provide theoretical support for this study, enabling it to further explore the integration of bronze mirror patterns and carving techniques in the modern education system. This study extends the above theoretical methods to the specific context of bronze mirror patterns and techniques, and explores how to effectively inherit and develop this traditional skill in the modern design education system through innovative education models (Yang,2020).

This study aims to fill this gap by systematically studying the art education value of Chinese bronze mirror patterns and exploring the integration of carving and chiseling techniques into contemporary art and design education. This study aims to contribute to the protection of valuable cultural heritage and the enrichment of modern design education by documenting traditional techniques and analyzing their educational measures. The significance of this work goes beyond academic interest, addressing the urgent need for cultural sustainability while enhancing the creative resources available to future generations of designers and artists. Through this fusion of tradition and innovation, this study proposes ways to make these ancient patterns and techniques a living tradition rather than a museum artifact.

Objectives

The research objectives of this article are mainly divided into the following three points:

1. To identify and categorize the artistic educational values of Chinese bronze mirror decorative patterns through analysis of historical specimens.
2. To analyze how to integrate traditional Chinese carving techniques into the modern art design education system for design innovation.
3. To document, systematize, and evaluate approaches for the sustainable inheritance and innovative development of traditional Chinese bronze mirror carving techniques.

Literature review

This article sorts out and summarizes the relevant documents and materials through the research method of literature analysis.

1. The Development and Evolution of Decorative Patterns of Chinese Bronze Mirrors

Recent scholarship has challenged traditional periods of bronze mirror development. While Kong's (1992) periodization framework for bronze mirror decorative motifs remains influential, Dang et al. (2021) have proposed a classification based on carving techniques that better reflects production methods relevant to educational dissemination. Gu (2011) further pointed out that the evolution of patterns is related to the broader cultural changes in Chinese aesthetic art, especially in the Song Dynasty. Dang and Sawatdee (2025) pointed out that Chinese national patterns are an important part of historical and cultural heritage and have an important position in the history of aesthetics.

The researchers have compiled information on the development and evolution of each dynasty as shown in the following table. The development of bronze mirrors in these different stages not only reflects the changes in the craftsmanship level in different historical periods, but also shows the diversity of ancient Chinese culture and social life. The information sorting and summary in this section provides reliable historical information for the study and learning of Chinese bronze mirror art.

Table 1 Information table on the development and evolution of various dynasties

Historical Period	Shape	Mirror Surface	Mirror Button	Pattern
Shang and Zhou Dynasties	Round	Nearly flat or slightly convex, thin	Arched, semicircular, rectangular	Plain mirror, double ring mirror, bird and animal pattern mirror





Historical Period	Shape	Mirror Surface	Mirror Button	Pattern
Spring and Autumn Period	Round, square	Nearly flat or slightly convex, thin, often with edges	Bow button	flower and leaf mirror, four mountain mirror, animal pattern mirror, coiled dragon pattern mirror, continuous arc pattern mirror
Han Dynasty	Round, square	Flat or slightly convex, thin	Round button, Square	mirrors with nebulae, mirrors with mythical beasts, mirrors with inscriptions, mirrors with deformed four-leaf patterns, mirrors with portraits
Three Kingdoms, Jin, Northern and Southern Dynasties	Round, square	Flat or slightly convex, thin	Round, Square, Arch	Mythical animal mirrors, deformed four-leaf pattern mirrors, and inscribed mirrors.
Sui, Tang, and Five Dynasties	Round, square, Diamond Style	Flat or slightly convex, thicker	Round, Square, Arch	Auspicious animal mirror, auspicious animal grape mirror
Song, Liao, and Jin Dynasties	Round, square, sunflower-shaped, mirror with handle, heart-shaped, shield-shaped, bell-shaped, tripod-shaped	Flat or slightly convex, thicker	Round, Square, Arch	Character story mirror, plain mirror, coiled dragon mirror, auspicious animal mirror, auspicious flower mirror, double fish mirror
Yuan and Ming Dynasties	Round, square, Diamond Style	Flat or slightly convex, small in shape	Round, Square, Arch	Liubo pattern mirror, auspicious beast, and grape mirror

Note: Drawn by the author.

2. Cultural Connotation of Decorative Patterns of Chinese Bronze Mirrors

The various classification systems established by early scholars have been refined in recent studies. Zhang (2024) proposed a four-category classification system that reclassified the various complex classification systems into animals, plants, people, and inscriptions. As Chen (2019) pointed out, the systematic classification of decorative patterns into categories is the basis for studying traditional Chinese decorative patterns. Chen (2019) believes that contemporary art and design education needs to integrate the knowledge of traditional Chinese patterns through interdisciplinary teaching opportunities.

Culture is the core and soul of a country and a nation. Traditional decorative patterns inherit the genes of China's excellent traditional culture, are the cornerstone of Chinese culture and an important part of aesthetics, and play the role of promoting the prosperity of Chinese culture, demonstrating Chinese cultural confidence, and realizing the self-reliance of Chinese culture. Bronze mirror decoration condenses the essence of culture and art, social folk customs, and religious beliefs, has important cultural value, and is conducive to the realization of national cultural confidence and national rejuvenation.

3. Modern Integration

Contemporary approaches to incorporating traditional decorative patterns into modern design education follow several different methodologies. Sun's (2019) research on art education reform shows that in contemporary art and design education, the digital protection and application of cultural heritage has become an important area, emphasizing the inheritance and innovation of cultural heritage in art and design education through digital technology. Tairab, Gochoo, and Jarrah (2022) found in their research on art education that current art education tends to be internationalized, with less content involving traditional handicrafts, resulting in students' insufficient understanding and inheritance of their own national traditional culture. However, Cahnmann-Taylor and Siegesmund (2018) pointed out that practice is an indispensable part of art education. This view provides important theoretical support for us to examine the necessity of practical courses in the context of art education.

Conceptual Framework

The conceptual framework of this research is shown in Figure 2:

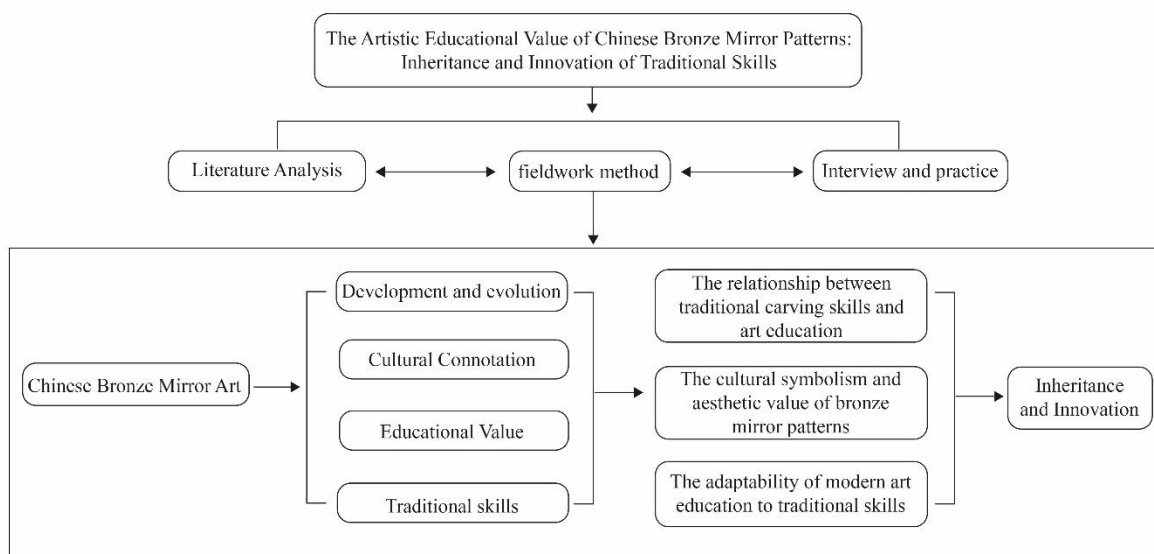


Figure 2: Conceptual Framework Diagram

Note: Drawn by the author

Methodology

This research adopts qualitative research methods, mainly including: literature analysis, field investigation, and interview research methods.

In the initial stage, the researcher adopted the literature research method to systematically collect, organize, and analyze relevant academic materials on Chinese bronze mirror art, aiming to fully understand its historical background, cultural connotation, traditional carving skills, art education value, and its relationship with contemporary art education.

Research tools: EndNote is selected as the management tool for this research document, which is used for systematic management and citation of documents. Through this tool, researchers can efficiently organize various types of literature materials, ensure the accuracy of literature citations, and help clarify the context of the research in the literature review. The document management tool also facilitates the classification, annotation, and rapid retrieval of different documents, which facilitates in-depth analysis of research results (Chen 2017).



Researchers need to visit academic databases and professional websites to collect relevant information. CNKI, Wanfang Data, JSTOR, and SCOPUS databases provide a large number of academic papers, journals, and conference materials. Researchers can search for relevant literature and research results by keywords to obtain the latest research trends.

Inclusion criteria for the literature: literature related to Chinese bronze mirror art and traditional crafts; research on the aesthetic and cultural symbolic meaning of bronze mirror patterns and decorations; research on the value, inheritance and application of traditional crafts in art education; academic journal papers, doctoral/master's degree theses, authoritative publications and conference papers; most of them were published from 2000 to the present, and some historical data books; both Chinese and English literature were included, but this study is about Chinese bronze mirrors, so most of the literature is in Chinese.

Exclusion criteria: non-academic materials, such as online comments, informal blogs, etc.; literature with repeated content, vague information, or no clear research methods; only introduces the process of bronze mirror technology, but does not involve cultural and aesthetic values.

The time range is selected from 2000 to 2025. Language considerations: mainly Chinese literature, while some English literature closely related to the topic is included to expand the international perspective and enrich the research dimension.

In order to deeply explore the carving and chiseling techniques of traditional Chinese bronze mirror craftsmanship and its application and inheritance in art education, this study adopts the field investigation method and selects Tianyichang Bronze Mirror Carving and Chiseling Center in Datong City, Shanxi Province, China, as the main research site. The center has long been committed to the protection and inheritance of traditional bronze mirror carving and chiseling skills. It not only has a professional carving and chiseling team and intangible cultural heritage inheritors, but also regularly carries out public education and craft display activities.

In terms of participants, the research contacted and recruited several masters and educators related to bronze mirror craftsmanship as interviewees through the assistance of the center director, including national and provincial intangible cultural heritage bronze mirror carving and chiseling skills inheritors, art and craft teachers, bronze mirror craft apprentices, and visitors. The interviewees were aged between 20 and 75 years old, with more than 5 years of work or teaching experience, covering representative groups at different levels from technology inheritance to educational communication.

Data collection was mainly based on semi-structured interviews and on-site observations (DiCicco-Bloom & Crabtree, 2006). The interview content revolves around the inheritance of bronze mirror craft techniques, cultural implications, practices, application paths in art education, and challenges in the context of the new era. Each interview lasts about 30 minutes and is conducted with the consent of the interviewee. The observation part focuses on the operational details of the on-site carving process. The researcher recorded the production environment, teaching activities, and interactions in the form of notes and images.

In terms of ethics, the research strictly follows the ethical standards of the humanities and social sciences research. All participants are informed and consented, and the purpose of the research is explained to ensure their voluntary participation. During the research process, all interviewees' information is anonymously processed and protected to ensure that the privacy of the interviewees is not compromised.

Figure 3 is a diagram of the research methods and tools drawn by the researchers:



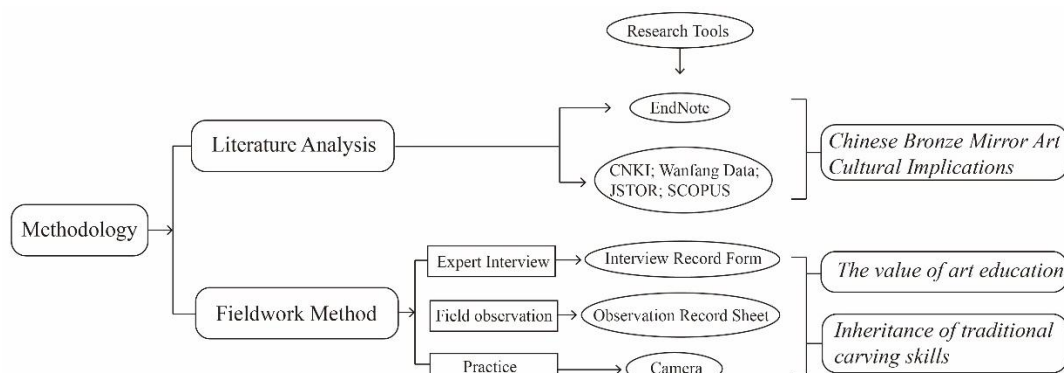


Figure 3: Illustration of Methodology

Note: Drawn by the author

Results



1. The symbolic meaning and aesthetic value of bronze mirror decoration are inspiring in art education.





Mr. Lian Chunhai talked about the function of constructing order symbols in the book "Artifact Images and Han Dynasty Beliefs": Bronze mirrors have the function of constructing order symbols. "Constructing order symbols" refers to expressing and maintaining a specific social or cultural order through certain objects, symbols, or images (Lian, 2024). In the context of bronze mirrors, this means that bronze mirrors are not only a practical object, but also a symbolic tool used to express and construct a certain order and meaning.

In ancient China, bronze mirrors were often given specific symbolic meanings, such as representing the sky, the sun, and light. These symbols not only play a decorative and practical role in daily life, but also play a role in specific religious ceremonies, sacrificial activities, tombs, and other occasions. For example, placing a bronze mirror in a tomb can symbolize the commemoration and blessing of the tomb owner, or it may mean praying for light, protecting the dead, etc. These symbols and meanings construct a specific cultural order through the existence and use of bronze mirrors, carrying symbols of specific cultural, religious, and social significance, and expressing, maintaining, and conveying a certain order and value concept through it (Dang and Sawatdee, 2025).

The patterns on bronze mirrors carry rich cultural connotations, such as the auspicious dragon and phoenix, which represent good fortune, the eight trigrams, which reflect Taoist philosophy, and the auspicious beasts, which symbolize exorcism and good fortune. These patterns are not only a presentation of visual art but also a reflection of the spiritual world of the ancients, showing the social beliefs, ethics, and aesthetic pursuits of different historical periods (Dang and Sawatdee, 2025).

Table 2 Decorative patterns and cultural connotations of representative Chinese bronze mirrors

No.	Bronze mirror pattern	Cultural Implications	Bronze mirror pictures
1	Dragon and Phoenix	Good luck and happiness	
2	Bagua Pattern	Taoist philosophy	

No.	Bronze mirror pattern	Cultural Implications	Bronze mirror pictures
3	Auspicious Beast Pattern	Exorcise evil spirits and bring good fortune	
4	Pisces pattern	Abundance and abundance every year	
5	Lotus pattern	Pure and clean	
6	Immortal Crane Longevity	Longevity and blessing	

Note: Drawn by the author.

The patterns on bronze mirrors are decorative, and their aesthetic value lies in their profound cultural implications and connotations, excellent craftsmanship, unique contemporary style, and rich artistic expression. It is not only a representative of ancient Chinese arts and crafts, but also an important witness to the cultural exchanges between the East and the West, historical changes, and the evolution of human aesthetics.

The symbolic meaning and aesthetic value of bronze mirror patterns are of great inspiration in art education. They can serve as a traditional cultural visual symbol resource to enhance students' understanding and aesthetic ability of Chinese culture.

2. The connection between traditional bronze mirror engraving technology and modern art education.

The relationship between the carving and chiseling technology of traditional bronze mirrors and the art design education of modern college students is mainly reflected in the following aspects:

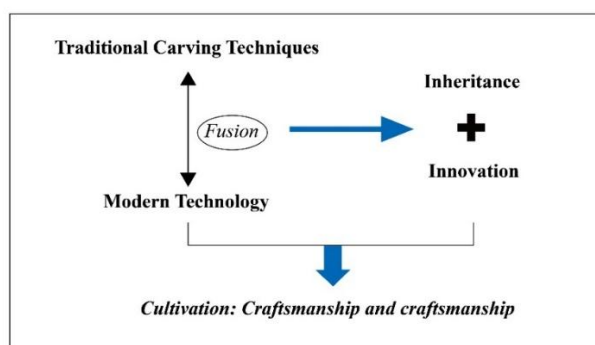


Figure 4 Relationship between traditional crafts and art education

Note: Drawn by the author



Traditional carving and chiseling techniques emphasize fine manual craftsmanship, flexibility, and vividness, and require high skills from carving and chiseling masters, which is in contrast to modern digital carving or 3D printing technology. College students can study the carving and chiseling techniques of bronze mirrors, understand the difference between the delicacy of manual skills and machine carving, feel the artistic charm brought by traditional intangible cultural heritage, experience the craftsmanship brought by traditional skills, and combine the essence of hand-carving in modern design and apply it to their designs. For example, in metal crafts or furniture design, you can try to combine carving and chiseling techniques with modern metal processing technology to create works that have both traditional charm and modern aesthetics.

Through the study and experience of bronze mirror carving and chiseling techniques, college students can deeply understand Chinese traditional culture and transform it into modern design language. For example, in the development of cultural and creative products, intangible cultural heritage derivatives, and museum cultural and creative designs, the patterns and craftsmanship characteristics of bronze mirrors are used to present traditional pattern art in a way that is more in line with the needs of modern consumers.

In recent years, art design courses in many universities have begun to pay attention to the innovative application of intangible cultural heritage, and bronze mirror carving and chiseling techniques are one of the traditional skills worthy of research and re-creation (Zhang, 2024).

The bronze mirror carving and chiseling process emphasizes patience, meticulousness, and control of materials. This craftsman spirit is a great inspiration for modern design education. College students can improve their understanding of materials and hands-on ability by practicing carving or studying traditional handicrafts, and cultivate a rigorous and meticulous design attitude.

The bronze mirror carving and chiseling process is not only an important part of Chinese traditional culture, but also provides a rich source of inspiration for modern college students' art design. In design education, we can study the craft characteristics of traditional bronze mirrors and apply them to modern design practice to achieve the combination of tradition and modernity and promote cultural innovation and inheritance.

The adaptability of modern art education to traditional Chinese carving techniques is mainly reflected in teaching courses, technical means, innovative applications, and cultural heritage.

Modern art education can incorporate carving techniques into college students' craft design courses, such as jewelry design, product design, cultural and creative design, and other professional directions, to form a comprehensive learning system. Combining traditional carving with modern carving technology, students can master more efficient modern production methods while learning traditional crafts. At the same time, practice and theory are combined. In college students' art education courses, not only are the operational skills of carving techniques taught, but also their history, cultural connotations, artistic value, etc., are integrated, so that students can have a deeper understanding of its aesthetic significance while practicing.

Many universities have opened cultural and creative design courses to encourage students to innovate products that meet market demand based on carving techniques. In terms of the inheritance and protection of carving techniques, many universities have cooperated with intangible cultural heritage craftsmen and enterprises to set up carving courses and invite traditional handicraft masters to give lectures or guidance, so that students can directly learn traditional skills and combine modern design concepts for innovative applications. At the same time, modern art education can enable more students and people in society to understand the carving and chiseling skills through online short video teaching and live courses, and promote its widespread dissemination (Mei, 2019).

In the teaching of carving and chiseling skills in modern art education, international exchange exhibitions, cross-cultural cooperation, and other methods can be used to allow traditional Chinese carving and chiseling crafts to enter the global design market and enhance the influence of traditional Chinese crafts.

Through the expert consultation method, the researchers interviewed experts such as inheritors of bronze mirror carving and chiseling skills and arts and crafts artists in Datong City, Shanxi Province, to



discuss the adaptive challenges faced by traditional Chinese carving and chiseling crafts, and analyze and explore their solutions. The content is recorded and organized as shown in Table 3.

Table 3 Adaptation challenges and solutions

Challenge	Solution
1. The learning cycle of traditional carving skills is long, and modern students have limited learning time.	Combine modern engraving technology to initially outline the pattern and achieve efficient learning.
2. It is difficult to combine hand-carving with modern industrial production	Try to combine new technologies, such as 3D printing, to achieve mass production.
3. The younger generation is not interested in traditional crafts	Through cultural and creative design, jewelry design, and other applications, we can make carving skills closer to modern life
4. The market value of traditional carving and chiseling techniques has yet to be explored	Through market research, we develop artworks that meet the aesthetic needs of modern consumers and the popular trends of modern society.

Note: Drawn by the author.

There is a deep connection between traditional bronze mirror carving craftsmanship and modern art education. Its technical and formal elements are highly adaptable in design courses, which can help promote innovative art design practices and enhance students' manual skills and creative thinking.

3. Sustainable inheritance and education of bronze mirror engraving skills.

The carving and chiseling craft is a representative characteristic skill of bronzeware in Datong City, Shanxi Province, China. Due to its high technical difficulty, the craftsmen engaged in this craft must have a certain aesthetic sense, and at the same time have a basic foundation in painting, design, and sculpture, and must master the basic skills of benchwork.

The researchers summarized the process of bronze mirror carving and chiseling through field investigation and combined with expert interviews and practical research methods, and summarized the main processes of bronze mirror carving and chiseling craftsmanship: pattern design, tracing or rubbing, glue making, gluing, carving and chiseling, beading, calendering, and flattening.

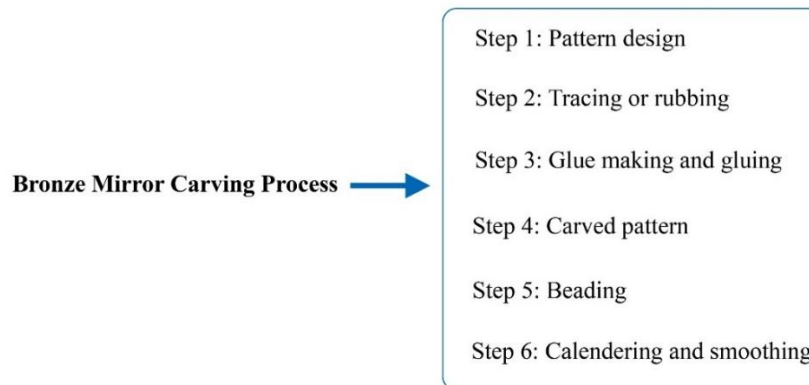


Figure 5: Diagram of steps for carving bronze mirrors

Note: Drawn by the author

Tracing or rubbing is to trace the pattern designed by the designer on the workpiece with carbon paper. For engraving large quantities of products, it can be engraved into a rubber plate and rubbed on the workpiece.

Gluing is to mix rosin, cement, and engine oil according to the ratio, melt them in an iron pot, and pour them on one side of the workpiece. It can be engraved after cooling. After engraving, it can be removed after heating with a blowtorch.

Engraving is to use of chisels of various shapes to engrave various patterns on the back of the bronze mirror. Its techniques are divided into positive chisel, negative chisel, flat chisel, and hollowing. Positive chisel is a method of knocking convex, which is a technique of engraving patterns protruding from the surface of the workpiece. Negative chisel is a method of knocking concave, which is a technique of engraving patterns recessed into the surface of the workpiece. A flat chisel is used to directly engrave the lines of the pattern on the surface of the workpiece. Hollowing is to chisel out the pattern on the workpiece, and then chisel along the edge of the pattern until the base is removed, leaving the hollow pattern.

These techniques are manual operations. The craftsmen hold the chisel in one hand and the hammer in the other hand, and make the surface of the workpiece appear concave and convex by hammering, making it concave and convex, staggered, clear light and dark, and strong contrast, making the bronze mirror pattern more vivid and becoming an exquisite work of art. The following picture shows the researcher practicing the bronze mirror carving and chiseling skills and discussing the research with experts.



Figure 6 Photo of researchers practicing bronze mirror carving techniques

Note: Photo taken by the researcher

Handicraft skills can promote college students' practical ability and innovative thinking, and hands-on practice can stimulate creativity. Compared with pure theoretical learning, handicraft skills require students to do it themselves. This practical process allows students to explore new methods and stimulate innovative thinking while solving practical problems.

Handicraft skills can cultivate college students' aesthetic ability and artistic expression. Handicrafts are closely integrated with traditional culture and art. Learning these skills can help students understand historical aesthetics and improve their artistic accomplishments. Handicrafts emphasize individuality and uniqueness, encourage students to express personal ideas through different techniques, and cultivate independent creative ability (Sun, 2019).

Learn from failure and cultivate college students' problem-solving ability. In the process of handicraft production, students need to constantly try and adjust, such as the problem of engraving errors in the process of carving. These challenges cultivate students' patience and problem-solving ability, making them more adaptable in future design practice (Banas and Polly, 2016).

Learning traditional hand-carving skills can help college students understand the artistic characteristics of their nation and apply them to modern design. Handicrafts are not limited to local culture, but can also draw on excellent global skills. Students can create internationally competitive works by comparing, learning, and applying classroom knowledge.



In the process of learning handicrafts, students often need to work in teams. This cooperation process not only improves communication skills but also helps students learn to coordinate work in different professional backgrounds and improve their comprehensive literacy.

With the rise of the handicraft market, many college students develop their brands by learning handicrafts. For example, many graduates promote handicraft works through e-commerce platforms or social media to start their businesses.

Handicraft skills have a profound impact on the cultivation of college students' creativity. It not only improves students' practical ability, aesthetic literacy, and problem-solving ability, but also promotes cultural understanding, interdisciplinary integration, and career development. In modern art education, the study of handicraft skills is not only the inheritance of traditional skills, but also an important way to cultivate innovative design thinking and improve comprehensive literacy.

As an intangible cultural heritage, the sustainable inheritance of bronze mirror carving techniques depends on educational intervention, the teaching of manual skills, and the reconstruction of cultural identity, especially in the art education system of universities, showing important practical and theoretical value.

Discussion

This study aims to explore the value and application path of traditional Chinese bronze mirror decoration and carving techniques in modern art design education. Through a variety of qualitative research methods such as literature analysis, expert interviews, and field surveys, the study not only sorted out the aesthetics and cultural connotations of bronze mirror art but also analyzed the integration and inheritance mechanism of traditional skills in contemporary education. The following discussion will be carried out one by one around the research objectives, clarifying the supplement and expansion of each research result to the original knowledge, and constructing an integrated research framework.

1. The Artistic Educational Value of Bronze Mirror Ornaments: Reinterpretation of Cultural Implications and Aesthetic Symbols.

The first goal of this study is to identify and summarize the artistic educational value of Chinese bronze mirror decorative patterns through historical sample analysis and educational practice. Expert interviews and literature jointly pointed out that the patterns on bronze mirrors (such as animals, plants, geometric and mythological patterns) contain profound cultural symbolic meanings and oriental aesthetic values. These traditional image elements have great application potential in modern art education, especially in graphic design, packaging design, jewelry design, and other courses.

The results further show that the bronze mirror patterns reflect symmetry, rhythm, and complex and delicate craftsmanship in form, which can effectively improve students' aesthetic literacy and traditional cultural perception ability. Compared with existing literature, this study is more in-depth from the perspective of teaching application, clarifies the specific integration methods of bronze mirror patterns in educational courses, and expands the scope of use of traditional art symbols as teaching resources.

2. Educational integration of traditional carving skills and design innovation paths.

For the second research goal, that is, to analyze how to integrate bronze mirror carving skills into the modern art design education system to achieve design innovation, the study shows that traditional carving and relief skills can not only be introduced into the classroom through copying practice and experience courses, but also can be combined with modern technical means (such as laser engraving, 3D printing, etc.) to develop innovative design courses. This combination not only enhances the technical depth of the course but also inspires students to integrate traditional aesthetics into contemporary expression (Belbase et al., 2022).

Through field visits to the bronze mirror carving center in Datong, Shanxi Province, and exchanges with the inheritors of the skills, the study found that the slow and meticulous characteristics of the skill contrast with the modern fast industrial design concept, which can inspire students to reflect on and reshape the spirit of craftsmanship in the course design. This proposes a new possible path for existing art education.



3. Sustainable inheritance of traditional skills and construction of educational mechanisms.

The third goal of this study is to evaluate the sustainable inheritance path of bronze mirror carving skills in the context of modern education and culture. Experts and researchers agree that bronze mirror carving, as a national intangible cultural heritage skill, is facing a severe inheritance crisis, especially due to the steep learning curve of skills, lack of interest among young people, and the incomplete establishment of market mechanisms. Although the government has protected it through the identification of intangible cultural heritage projects and the funding of inheritors, it is difficult to solve the fundamental problem by relying solely on policies.

The study further proposes that the education system should be intervened in, especially in the courses of fine arts majors in colleges and universities, to guide students to participate in the re-creation of bronze mirror crafts, to understand, absorb, and develop traditional skills in practice (Blackley & Howell, 2015). At the same time, bronze mirror patterns should be promoted to enter the fields of cultural and creative products, digital media, and brand design, to realize the connection between traditional crafts and modern market needs. This not only expands the existing theoretical vision of intangible cultural heritage inheritance but also provides a specific and feasible path for the integration of teaching and market (Aguilera and Ortiz-Revilla, 2021).

Through the discussion of the three research objectives, it can be seen that they are not isolated from each other, but rather construct a holistic framework in the three dimensions of education, culture, and market:

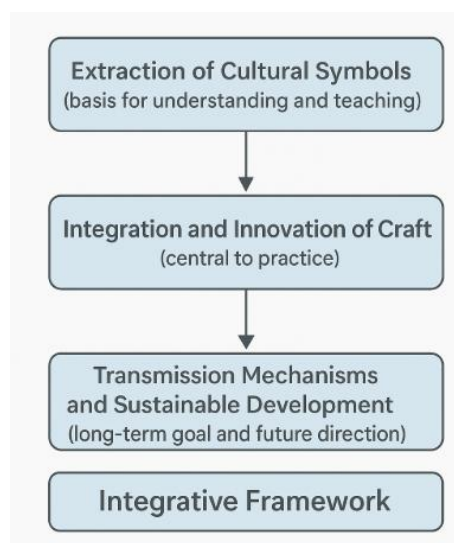


Figure 7 The relationship between the comprehensive framework and each research objective

Note: Researcher's drawing

The three together constitute a complete and future-oriented traditional craft education transformation model. This study not only enriches the research perspective of Chinese bronze mirror art but also provides systematic methodological support for the integration of traditional skills into contemporary education.

Conclusion

Based on the objectives and results of this research, the researchers draw the following conclusions:

1. The artistic educational value of Chinese bronze mirror patterns.

Chinese bronze mirror patterns contain rich historical and cultural information, aesthetic ideas, and cultural implications, and are of great value to art design education. The patterns on bronze mirrors not only show the aesthetic concepts and cultural emotions of different eras, but also reflect the development context



of bronze mirror art carving and chiseling technology. By studying bronze mirror patterns, students can deeply understand the formal beauty rules, symbolic meanings, and cultural connotations of traditional Chinese art, thereby improving their artistic appreciation ability and design thinking.

2. Innovative integration of traditional carving and chiseling skills in modern art design education.

This research analyzes and explores the exquisite techniques and processes of Chinese bronze mirror carving and chiseling technology, and its skills provide rich inspiration for modern art design education methods. In the modern art design education system, traditional carving and chiseling skills can be combined with modern digital technology and theoretical classrooms to explore new forms of design products and visual art expressions. This not only helps to cultivate students' practical skills, but also inspires college students' innovative thinking and realizes the contemporary application of traditional crafts.

3. Inheritance and development of Chinese bronze mirror carving and chiseling techniques.

The protection and development of Chinese bronze mirror carving and chiseling techniques requires the establishment of a more complete inheritance mechanism in college students' art design education classes. By setting up special courses, conducting practical workshops, and promoting school-enterprise cooperation, students' cognition and practical ability of traditional crafts can be enhanced. In addition, using modern Internet means to record and spread carving and chiseling techniques can not only pass on bronze mirror carving and chiseling techniques in China, but also enhance its influence in the international community, thereby promoting the sustainable inheritance and innovative development of traditional Chinese carving and chiseling techniques (Zhu and Wasin, 2024).

Recommendation

The research believes that it is possible to promote the inheritance and innovation of Chinese bronze mirror pattern art in modern design education from both theoretical and practical levels, inject new vitality into traditional skills, and make it radiate a unique cultural charm in the era of globalization. The researchers summarized the following four recommendations:

1. Improve the curriculum system and interdisciplinary integration.

It is recommended that courses on traditional Chinese bronze mirror pattern art be offered in art design and related majors in colleges and universities, including both theoretical knowledge, such as traditional cultural connotations and aesthetic characteristics, and practical skills, such as manual skills, traditional intangible cultural heritage carving techniques, and modern design expression methods. The course should also combine disciplines such as history and digital media technology, integrate traditional bronze mirror pattern art with modern design, virtual reality, 3D modeling, and other modern design fields, explore the possibility of cross-border design and innovation, and cultivate students' innovative thinking.

2. Strengthen the training mechanism of inheritors and improve the acceptance.

In the modern education system, the acceptance of bronze mirror carving skills still needs to be further improved. School-enterprise cooperation should be strengthened, and inheritors of intangible cultural heritage skills and masters of carving and chiseling should be encouraged to teach on campus. Special lectures, workshops, and field trips should be held regularly to bring traditional skills into the classroom, so that students can directly learn and feel the unique charm of bronze mirror patterns from the masters of skills. To attract more young people to devote themselves to the study and inheritance of this traditional skill.

3. Strengthen social publicity.

Through media publicity, exhibitions, cultural festivals, and other forms, the public's awareness and interest in the art of Chinese bronze mirror patterns should be improved. Comprehensively utilize online and offline network platforms to stimulate the resonance of the whole society on the protection and inheritance of traditional art, and create a good social atmosphere for art education.

4. Explore international exchanges and cooperation.





Actively organize and participate in international traditional crafts and design forums and academic seminars, invite foreign experts, designers, and scholars to participate in discussions, and jointly explore the inheritance and innovation of traditional patterns in the global context. At the same time, absorb advanced foreign design concepts and technical means to expand the influence of traditional art in the international market.

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