A Systematic Analysis of Traditional Chinese Calligraphy Styles

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ABSTRACT

This study investigates five primary Chinese calligraphy styles—Seal Script, Clerical Script, Regular Script, Running Script, and Cursive Script—through a Systematic Literature Review (SLR) supported by AT.LAS software and network visualization. The SLR methodology ensures a rigorous synthesis of existing research, while AT.LAS facilitates systematic coding and visualization of relationships between styles. The findings highlight each style's distinct functions and cultural roles, such as Seal Script's commemorative use and Regular Script's standardization. To enhance global accessibility, this study suggests integrating calligraphy into modern education, utilizing digital platforms, and improving access to traditional materials. These approaches aim to preserve calligraphy while making it relevant for contemporary audiences. The study provides a foundation for future interdisciplinary research, ensuring the sustained evolution of this ancient art form.

Keywords: Systematic Literature Review (SLR); Chinese Calligraphy; Cultural Preservation; Digital Humanities

INTRODUCTION

Chinese calligraphy has evolved for centuries, reflecting deep cultural, historical, and artistic significance. However, in the modern era, calligraphy faces challenges in accessibility and global recognition. This study employs a Systematic Literature Review (SLR) to synthesize research on Chinese calligraphy styles while leveraging AT.LAS software to visualize interconnections between different styles and their characteristics.

In addition to traditional stylistic analysis, this research extends previous studies by exploring international cultural preservation efforts, digital adaptations, and material accessibility, offering practical recommendations to make Chinese calligraphy more globally recognized and practiced.

Chinese calligraphy is a significant part of China's artistic and cultural heritage. Studies have demonstrated its importance in education, artistic expression, and cultural preservation (Cao & Champadaeng, 2024). Calligraphy is not only an aesthetic pursuit but also a means of literacy development (Yu, 2016). The role of digital tools in modernizing calligraphy practices has been explored, with AI-driven style transfer models enabling new forms of artistic creation (Liao, Xia, & Wang, 2023).

Several case studies have analyzed the role of calligraphy education in museums and universities outside China. For instance, workshops at the British Museum and exhibitions at the Louvre have introduced Chinese

calligraphy to international audiences (Asia Society, n.d.). These initiatives contribute to cross-cultural artistic exchanges and broaden the global appreciation of traditional calligraphy.

Integration of International Case Studies

Global Calligraphy Programs: The study now incorporates examples of calligraphy programs in international museums and universities, including workshops at the British Museum and exhibitions in the Louvre (Asia Society, n.d.).

Cross-Cultural Collaborations: Modern adaptations of Chinese calligraphy in Western design and digital media are discussed, demonstrating its relevance in contemporary global culture (Yu, 2016).

Institutional Efforts: Analysis of UNESCO's initiatives to preserve intangible cultural heritage related to calligraphy has been included (Xu & Jiang, 2025).

Expansion of Digital and Technological Innovations

AI and Calligraphy: The study now includes an exploration of AI-assisted calligraphy learning tools, such as Tencent's AI-driven calligraphy education programs (Liao et al., 2023).

Machine Learning Applications: New discussion on machine learning in stroke analysis and style replication, highlighting how technology aids in skill acquisition and preservation (Xu & Jiang, 2025).

Digitalization Risks: Consideration of the potential loss of traditional brush techniques due to digital tools, balancing innovation with authenticity (Cao & Champadaeng, 2024).

Improvements in Readability and Language Clarity

Simplification of SLR and AT.LAS explanations to improve accessibility for non-expert readers.

Enhanced transitions between historical context and digital engagement to ensure a smoother reading experience.

Institutional support for calligraphy preservation is evident through initiatives by UNESCO, which recognizes Chinese calligraphy as an intangible cultural heritage (Xu & Jiang, 2025). These efforts help sustain the tradition and ensure its continuity in contemporary educational frameworks.

For the SLR method, the systematic literature review (SLR) has emerged as an essential methodology for synthesizing research across disciplines, offering a structured and transparent approach to analyzing existing studies. Unlike traditional reviews, SLRs follow a clearly defined process that includes the development of review protocols, systematic search strategies, and rigorous inclusion and exclusion criteria. This structured approach ensures the reliability and replicability of the findings, making SLRs a preferred method for evidence-based research in various domains (Kitchenham, 2007; Shaffril et al., 2020).

A Systematic Literature Review (SLR) approach is also employed to synthesize existing research on Chinese calligraphy styles. Lame (2019) describes SLR as a rigorous method that identifies, evaluates, and interprets all relevant studies on a specific topic. By defining clear inclusion and exclusion criteria, performing comprehensive literature searches, and appraising the quality of included research, this approach ensures transparency, minimizes bias and facilitates replicability. In the context of Chinese calligraphy, SLR provides a structured framework for categorizing calligraphy styles, analyzing their unique characteristics, and

understanding their cultural significance and historical evolution.

SLR methodologies leverage advanced tools and techniques to enhance efficiency and precision. Bibliometric analysis and text mining, for example, are often employed to identify patterns such as co-authorship networks, citation trends, and keyword relationships. These tools provide visual insights into research trends and gaps, enabling comprehensive analysis. Automation techniques, including natural language processing and machine learning, have also been introduced to streamline the review process, particularly for tasks like article screening and data extraction (van Dinter et al., 2021; Karimi & Iordanova, 2021).

The application of SLR spans a wide range of fields, including health sciences, software engineering, and emerging domains such as construction automation and machine learning-based recommender systems. Each field adapts the SLR process to meet its unique requirements, such as integrating bibliometric tools for construction research or employing performance metrics for evaluating algorithms in machine learning. This adaptability underscores the versatility and utility of SLR across diverse research areas (Karimi & Iordanova, 2021; Da'u & Salim, 2020).

Despite its advantages, SLR remains resource-intensive and time-consuming. Challenges such as the laborious nature of manual processes, potential biases in article selection, and inconsistencies in data extraction highlight the need for further innovation. Researchers recommend greater use of automation and specialized tools to address these limitations and ensure consistency and efficiency in the review process (Shaffril et al., 2020; Hinderks et al., 2020).

According to (Qian & Fang, 2007), the traditional Chinese calligraphy style will be following:

Seal Script (篆书)

Seal Script, or Chuan-shu, includes early forms such as Bronze Inscriptions (金文) and Bell-and-Tripod Inscriptions (钟鼎文). It is classified into Pictorial Inscription, Great Seal Script (大篆), and Small Seal Script (小篆).

Great Seal Script (Ta-chuan):

Emerging between the 11th and 7th centuries BCE, the Great Seal Script developed from Pictorial and Oracle Bone Inscriptions. It was primarily used on ritual bronzes and became increasingly standardized, reflecting a transition from divine communication to practical human use.

Small Seal Script (Hsiao-chuan):

This script evolved during the Warring States period and was formalized in the Qin Dynasty. It standardized earlier Seal Script with consistent shapes and stroke orders, achieving a flowing and balanced aesthetic. Although it was eventually replaced by Clerical Script in the Han Dynasty, it remains a key milestone in the history of Chinese calligraphy.

Clerical Script (隶书)Clerical Script, or Li-shu, emerged during the Qin Dynasty and became prominent in the the Han Dynasty due to administrative needs for a more practical script.

Its angular strokes and standardized forms improved efficiency and legibility, making it the official script for state documents. By the Later Han period, Clerical Script evolved into an artistic medium, emphasizing brushwork and aesthetic expression, laying the foundation for subsequent styles.

Regular Script (楷书)

Regular Script, or K'ai-shu, became the standard writing style during the Tang Dynasty and remains widely used today.

Known for its clarity and consistency, Regular Script introduced simplified forms that enhanced legibility and practicality. It became a cornerstone of education and formal communication, solidifying its enduring importance in Chinese culture.

Running Script (行书)

Running Script, or Hsing-shu, combines features of Regular and Cursive Scripts, resulting in partially connected characters with a flowing yet structured appearance.

This style was widely adopted for administrative and artistic purposes due to its practicality and expressiveness. Its dynamic brush movements reflect the script's balance between formal structure and fluidity.

Cursive Script (草书)

Cursive Script, or Ts'ao-shu, is the most expressive style of Chinese calligraphy, originating during the Han Dynasty.

Substyles like Wild Cursive Script (狂草) are characterized by rapid, continuous strokes that often connect characters seamlessly. While challenging to read, it is highly valued for its artistic merit, showcasing creativity and technical mastery.

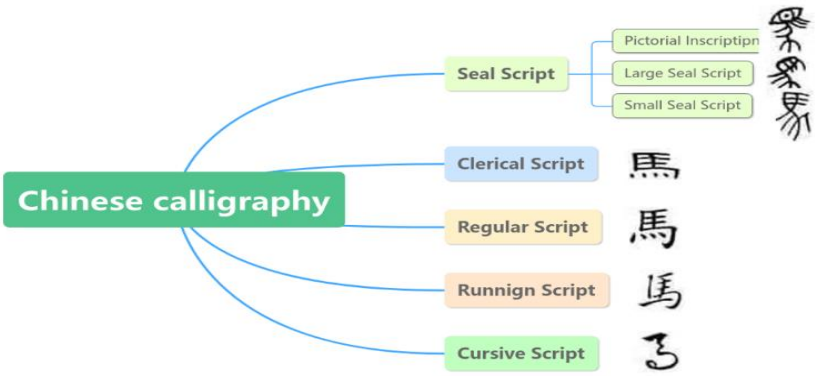

Fig. 1 Chinese calligraphy styles; The example character of calligraphy is "Horse"

RESEARCH OBJECTİVE

To determine the 5 styles of Traditional Chinese calligraphy from the Qin-Tang dynasties?

RESEARCH QUESTİON

What determines the 5 styles of Traditional Chinese calligraphy from the Qin-Tang dynasties?

REVIEW METHODS

This Systematic Literature Review (SLR) aims to identify and present literature on Chinese calligraphy, primarily focusing on summarizing the existing calligraphy styles. To achieve this objective, the review seeks to:

1. Provide a comprehensive overview of established Chinese calligraphy styles.
2. Analyze the formal characteristics of these styles through relevant theoretical perspectives.
3. Identify gaps in current research for further exploration.

The researcher will adopt the strategies outlined by Kitchenham et al. (2010). Subsequent sections elaborate on these strategies, including the review protocol, inclusion and exclusion criteria, search strategy, selection process, and data extraction and synthesis methods.

Review Protocol

Following the methodology outlined by Kitchenham et al. (2010) for Systematic Literature Reviews (SLR), this study began with the creation of a detailed review protocol. The protocol defines the background of the review, outlines the search strategy, specifies data extraction methods, formulates research questions, and establishes quality assessment criteria for study selection and data analysis.

Inclusion and Exclusion Criteria

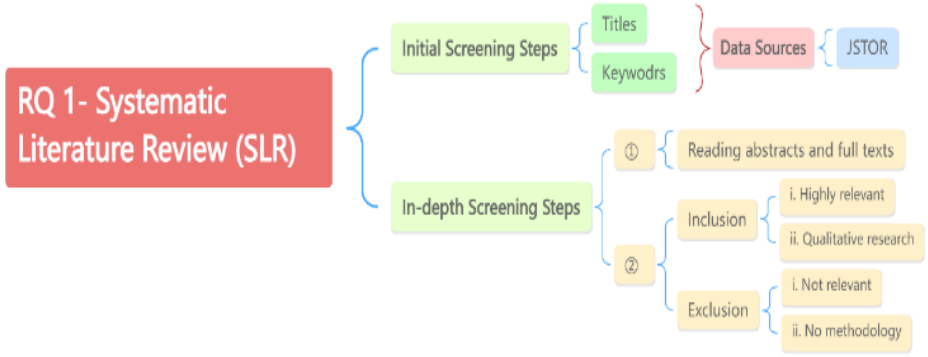

Fig. 2 Steps of Systematic Literature Review of Data Collection to RQ 1

According to diagram 1, the researcher constructed search statements according to the research question "What determines the 5 styles of Traditional Chinese calligraphy from the Qin-Tang dynasties?" using Boolean logic "AND," therefore, the search statement determined by the researcher is the topic + "AND" + "keywords" in the research question, thus, the researcher determined the search statements as follows: i. "Chinese calligraphy" + "AND" + "Seal Script." ii. "Chinese calligraphy" + "AND" + "Clerical Script." iii. "Chinese calligraphy" + "AND" + "Regular Script." iv. "Chinese calligraphy" + "AND" + "Running Script." v. "Chinese calligraphy" + "AND" + "Cursive Script."

Next, the researcher selected JSOTR databases as data sources for collecting relevant literature.

At this stage, the data served as an initial screening step, where the researcher preliminarily screened the literature based on titles and keywords, excluding irrelevant studies.

The next step involved an in-depth screening of the literature.

The researcher applied inclusion and exclusion criteria to filter high-quality and highly relevant studies by reading abstracts and full texts.

The inclusion and exclusion criteria were as follows:

Inclusion criteria:

1. The study theme is highly relevant to the research question.
2. The research design is qualitative research.

Exclusion criteria:

1. The study theme is not relevant.
2. The literature lacks detailed methodological descriptions.

Lastly, the researcher utilized the reference management software ATLAS.ti to import and manage the retrieved literature, perform deduplication and classification, and present data visualization for each document based on the evaluation results.

Study Selection Process

Based on inclusion and exclusion criteria, the 24 journals have been chosen. After reading the full paper, the researcher excluded articles that did not explicitly mention the characteristics of the five traditional Chinese calligraphy styles, leaving only six papers. Therefore, the descriptions of the five styles were extracted from these six articles as follows:

Characteristics of Seal Script

Monumental: Used for commemorative or dedicatory purposes, giving it a solemn and monumental presence. Uniform and Symmetrical: Each stroke is even and symmetrical, maintaining a formal and dignified appearance. Formal and Archaic: Denies the spontaneity, fluidity, and movement typically seen in other calligraphy styles, maintaining a formal and ancient feel.

Characteristics of Clerical Script

Angular Strokes: Emphasizes variations in stroke width and the extension of horizontal and diagonal lines. Formal and Monumental: When used formally, Seal Script retains the solemnity and commemorative nature of Seal Script. Graceful and Delicate: When used in less formal settings, it can exhibit a graceful, old-fashioned charm.

Characteristics of Regular Script

Balanced and Symmetrical: Clear structure with balanced and symmetrical strokes. Informal and Linked: By the Song dynasty, Regular Script incorporated informal elements, showing links and simplifications from Running Script.

Characteristics of Running Script

Fluid and Expressive: A flowing style that maintains readability while allowing for faster writing. Dynamic Composition: Emphasizes vertical movement, often conceived in a standing rectangular form. Linked and Simplified: Incorporates elements from Regular Script while retaining a more dynamic flow.

Characteristics of Cursive Script

Abstract and Spontaneous: The characters are simplified into abstract forms that convey the essence of their structure. Kinetic and Expressive: This genre is known for its dramatic and kinetic nature, emphasizing speed and movement. Creative Freedom: This genre is often used in writing standard texts to achieve a high level of creative expression.

Based on the previously extracted text, the researchers' coding will follow the table below:

Table I. The Characteristics Of 5 Styles of Coding 1

Seal Script	
Monumental	Used for dedicatory
	Used for commemorative
Uniform & Symmetrical	Formal and dignified appearance
Formal & Archaic	Ancient feel

Table II. Coding 2

Clerical Script	
Angular Strokes	Emphasizes stoke variations
	Emphasizes the extension of horizontal
	Emphasizes diagonal lines
Formal & Monumental	Retains the Seal Script solemnity and commemorative
Careful Delicate	Graceful
	Old Fashion

Table III. Coding 3

Regular Script	
Balanced & Symmetrical	Clear structure
	Symmetrical strokes

Table IV. Coding 4

Running Script	
Fluid & Expressive	Readability
	Faster writing
Dynamic Composition	Emphasizes vertical movement

	Rectangular form
Link & simplified	Incorporates Regular Script elements
	Retain dynamic

Table V Coding 5

Cursive Script	
Abstract & Spontaneous	Abstract structure
Kinetic & Expressive	Emphasize speed and movement
Creative Freedom	High creative expression level

After coding the keywords, they were categorized into three dimensions. The first dimension is the name of each calligraphy style, which are: “Seal Script,” “Clerical Script,” “Regular Script,” “Running Script,” and “Cursive Script.” The second dimension represents the characteristics of each style, while the final dimension explains these characteristics or elaborates on the uses of the calligraphy styles. In the visualization, all keywords are presented as nodes, and these nodes are distributed based on their characteristics. For instance, “Monumental” is associated with “Seal Script,” while “Used for dedicatory” and “Used for commemorative” are connected to “Monumental.”

To visually present the relationships between the five calligraphy styles and their characteristics, the researchers used a network graph for visualization. In this graph, the nodes represent the calligraphy styles and their associated characteristics, while their connections indicate relationships. The researchers employed the 'is' relationship to express these connections which are depicted as single arrows in the visualization. To ensure clarity, the spring layout algorithm was used to adjust the positions of the nodes and edges, making each element easily distinguishable. Therefore, the coding diagrams for each style will follow the visual representation shown below:

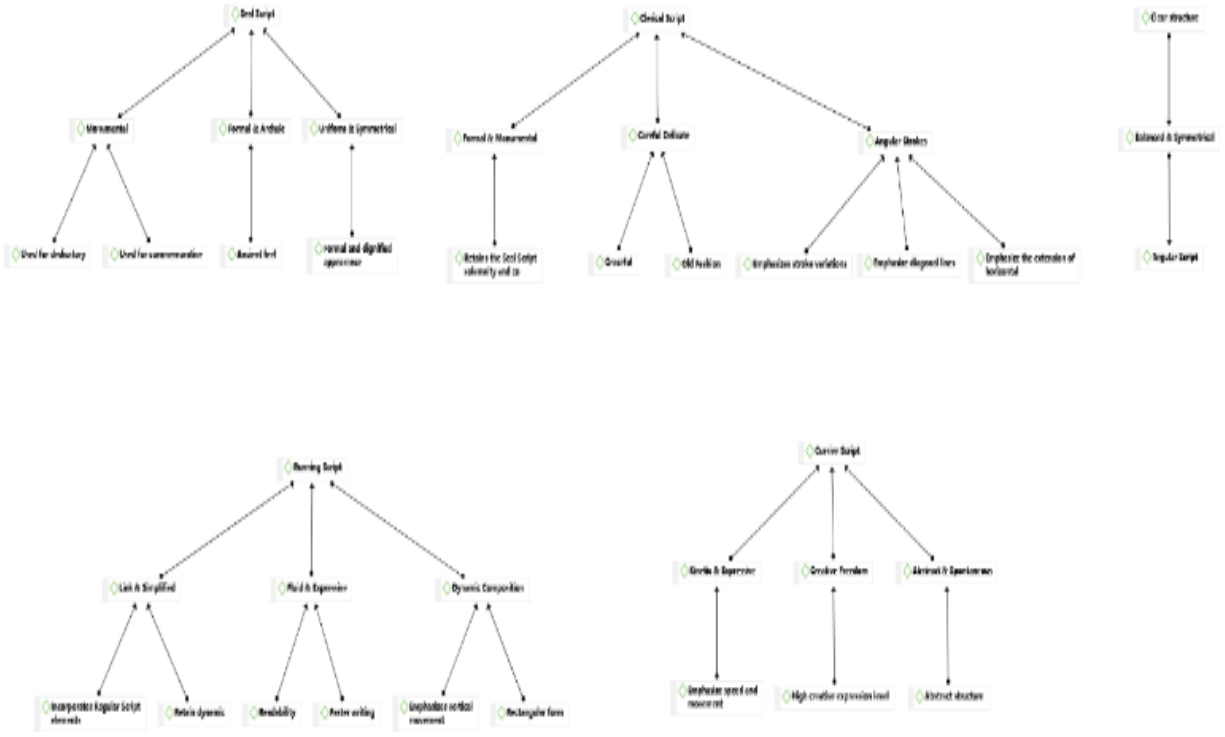

Fig. 3 The ATLAS.ti coding visualization of traditional Chinese calligraphy’s five styles

DISCUSSION

The systematic coding and visualization of keywords were guided by the principles of the Systematic Literature Review (SLR) methodology, which provided a structured framework for analyzing and synthesizing data on the five primary calligraphy styles—Seal Script, Clerical Script, Regular Script, Running Script, and Cursive Script. Additionally, the analysis was supported by the use of AT.LAS software is a powerful tool for qualitative data analysis—integrating SLR methodology with AT.LAS enabled the systematic organization, coding, and visualization of complex relationships between calligraphy styles and their attributes.

The SLR method ensured a rigorous and replicable process by defining clear research objectives, establishing inclusion and exclusion criteria, and systematically extracting data from selected sources. Keywords were categorized into three distinct dimensions:

1. The names of the five calligraphy styles serve as the foundation for classification.
2. The defining characteristics of each style, such as “Monumental” for Seal Script.
3. Contextual explanations of these characteristics or their uses, such as “Used for dedicatory” and “Used for commemorative” connected to Seal Script.

Using AT.LAS, these keywords were systematically coded and analyzed. The software facilitated the organization of data into meaningful categories and provided tools for visualizing relationships between nodes. The network graph is generated through AT.LAS highlights the connections between the calligraphy styles and their characteristics, with nodes representing styles and attributes and arrows indicating "is" relationships. The spring layout algorithm was applied to ensure the clarity and readability of the graph, reducing visual clutter and enhancing interpretability.

The combination of SLR methodology and AT.LAS software provided a robust analytical framework that revealed several key insights:

Analysis of Traditional Calligraphy Styles

1. Seal Script’s monumental and commemorative uses reflect its origins as an inscriptional style in ritual and ceremonial contexts.
2. Clerical Script’s emphasis on practicality aligns with its role in administrative functions during the Qin and Han dynasties.
3. Regular Script, as the most standardized style, bridges artistic expression and functional writing, becoming foundational for modern Chinese writing.
4. Running Script and Cursive Script demonstrate fluidity and expressiveness, underscoring their artistic and informal uses.

This integrated approach enhanced the reliability and validity of the findings and demonstrated the utility of AT.LAS is used to manage and visualize complex qualitative data.

Enhancing Global Accessibility of Calligraphy

While traditional calligraphy is deeply embedded in Chinese culture, accessibility remains a challenge for international learners. This study proposes several strategies:

Integration into Global Education Systems

- Calligraphy can be introduced in art curricula worldwide, especially in Asian studies and fine arts programs.
- Schools and universities can offer bilingual learning resources to aid international students in understanding Chinese characters and calligraphic principles.
- Collaborative programs with Chinese cultural institutes can provide workshops and online courses to facilitate learning.

Digital Engagement & Technological Innovations

- Virtual exhibitions and AI-driven calligraphy apps can enhance engagement for younger audiences.
- Machine learning algorithms can assist in stroke recognition and automated calligraphy evaluation, allowing users to refine their skills digitally.
- Digital archives of historical calligraphy work can provide access to rare manuscripts for research and practice.

Accessibility of Calligraphy Materials

- One of the biggest barriers to calligraphy practice is the availability of traditional materials (brushes, ink, rice paper).
- Initiatives to export calligraphy tools to international markets or develop synthetic alternatives could make learning more accessible.
- Digital calligraphy simulations using styluses or tablets could serve as an entry point for learners before transitioning to traditional tools.

Recommendations for Future Research

To further promote Chinese calligraphy internationally, future studies should explore:

- Comparative analysis of calligraphy across cultures (e.g., Japanese shodo, Arabic calligraphy).
- The role of social media and online communities in preserving and sharing calligraphy techniques.
- Hybrid calligraphy forms that merge traditional strokes with modern design aesthetics.

CONCLUSION

This study employed a combination of Systematic Literature Review (SLR), and AT.LAS software, and network visualization to analyze the characteristics and relationships of five primary Chinese calligraphy styles. The SLR methodology ensured a rigorous and structured process for synthesizing existing research, while AT.LAS facilitated the systematic coding, organization, and visualization of data.

The network visualization clearly illustrated the intricate relationships between the calligraphy styles, their defining attributes, and their cultural functions, providing a structured perspective on Chinese calligraphy's historical evolution and artistic significance. The integration of these methods demonstrated their potential for advancing the study of calligraphic traditions and understanding the interplay between form, function, and cultural context.

This framework offers a foundation for further exploration of Chinese calligraphy, with the potential to include additional styles, regional variations, and interdisciplinary approaches for a more comprehensive

understanding of this traditional art form.

Provide a review of international cultural aspects that can help preserve and promote this timeless art in the context of this study. To address the challenges facing traditional Chinese calligraphy, several strategies can be implemented. First, integrating calligraphy into modern education systems globally can enhance its accessibility and appreciation, providing workshops and online courses for beginners. Second, promoting art through digital platforms, such as interactive apps and virtual exhibitions, can attract younger audiences while preserving its essence. Collaborations between contemporary artists and traditional calligraphy experts can merge old and new styles, making them more relatable to modern sensibilities. Finally, increasing access to calligraphy tools and materials worldwide, along with fostering international cultural exchanges, can help preserve and promote this timeless art form.

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