From Model Copying to Independent Creation: A Study of AIGC-Enabled Transition in University Calligraphy Teaching

Junyu Wu*

College of Art, Liaoning Communication University, Shenyang 110136, China

* Corresponding author

Abstract

University calligraphy teaching currently faces three difficulties: students can copy established models competently but have not acquired the ability to create independently; the stylistic relationships between stele inscriptions or rubbings and the later copies derived from them cannot be fully displayed in static plates, which makes comparative analysis difficult; and assessment rests solely on the finished piece produced at the end of term, leaving no record of the choices involved in compositional design. This paper applies generative artificial intelligence (AIGC) to the design of university-level running-script courses and proposes an integrated pedagogical framework: "LLM-assisted inquiry into stylistic genealogy-multimodal AIGC-driven generation of intermediate stylistic states-human–machine comparison and negotiation of composition-portfolio-based process-oriented assessment." A teaching experiment conducted in a "Running Script: Copying and Creation" course has shown that this approach substantially benefits the transition from copying to creation, the articulation of stylistic language, and the documentation of compositional decisions, and thus constitutes a viable method for bridging copying and creation. The risks introduced by technology-stylistic homogenization, the misreading of historical information, and the weakening of handwriting training-are also addressed with corresponding countermeasures. The strategies proposed offer a practical, workable route for the digitalization of calligraphy education.

Keywords

Artificial intelligence, university calligraphy teaching, copying-to-creation transition, stylistic genealogy, process-oriented assessment.

1. Statement of the Problem

The development of AIGC has outpaced common expectations, and its application in art education is no longer a distant prospect but an issue that classrooms must address today. University calligraphy teaching currently occupies a rather complicated position: it is expected both to give students a reasonably complete understanding of calligraphic history and its associated aesthetics and culture, and to have them produce work in a personal style on the basis of what they have gained through copying practice. In principle, copying and creation are two parts of a continuous process; in practice, however, they are mostly treated as separate steps, and the question of how to connect them-how the transition is to be made-has largely been left outside instructional design[1].

The teaching bottlenecks encountered at present fall into three categories.

The first is the invisibility of stylistic genealogy. A model is not a fixed, unchanging object but one link in a historical chain: the original stele, the rubbing taken from the incised stone, later traced copies, and the reinterpretations of calligraphers in successive periods all differ in line thickness, in the handling of turns, and in the spacing between lines. In Calligraphy Pedagogy,

Chen Zhenlian argues that calligraphy teaching cannot confine itself to producing correct character forms; it must also attend to training in the language of form and in aesthetic perception[1], a kind of training that takes the rewriting of form as its thread and does not rely on form alone[2]. Yet the resources used in current courses remain, by and large, single-page illustrations or finished copybooks. Students may be able to reproduce a given outward shape, but they do not understand how the various versions relate to one another; when asked to undertake a task such as "creation," no visible ladder has in fact been built from the model to their own brushwork.

The second is the scarcity of feedback at the point of transition. Guidance on moving from copying to creation is, by its nature, a highly individualized form of mediation: the teacher must set a draft alongside the model, identify item by item where it repeats and where it departs, and distinguish a meaningful variation from a loss of control. With several dozen students and no unlimited supply of time, a teacher can hardly examine every draft closely enough to reconstruct the process by which each student made their decisions. While their own writing is still immature, most students simply copy mechanically or distort forms arbitrarily, with no one to explain the difference between the two[3].

The third is the lateness or one-sidedness of assessment. Under the traditional method, only the end-of-term product serves as the criterion of judgement; teachers have no opportunity to examine how students actually developed and revised their thinking about models, variants, line spacing, brush character, and classical forms, and instruction therefore cannot respond to that development in any targeted way.

AIGC offers a new way of addressing these difficulties. Its role should be stated clearly: the tools in question serve only as aids, used to make the space between copying and creation explicit and comparable; they should neither replace nor negate the teacher's judgement or the student's actual practice[4].

2. Rationale for AIGC-Supported Teaching of the Copying-to-Creation Transition

2.1. Constructing Comparable Learning Situations from a Constructivist Perspective

From a constructivist standpoint, knowledge is something learners actively construct within particular situations, not a block of information handed to them (Vygotsky, 1978)[5]. To enter the copying-to-creation transition, the most productive learning situation is one in which students can call up their own drafts, known exemplars, and related variants at any time, locate the style they are using within the genealogy, and plan their next attempt accordingly. Because class hours and the plates available to the teacher are limited, the traditional classroom cannot guarantee such comparative opportunities for every student. AIGC can generate, within seconds, visual materials such as side-by-side comparisons of rubbings, interpolated glyph forms between two stylistic poles, and alternative arrangements within a line, thereby delivering the closed loop of "input a model-generate intermediate states-make an aesthetic judgement-revise and rewrite" to trial-and-error at low cost. This approach restores the abstract idea of "being grounded in a model" to visible, tangible visual information and removes a major cognitive obstacle for beginners. At the same time, the variants AIGC supplies are essentially objects of observation belonging to a "writing situation," and so help move students from "reproducing glyphs" toward thinking about style, brushwork, and space.

2.2. Redistributing Cognitive Load

The central concern of cognitive load theory is that a learner's mental resources are finite: if they are spent over long periods on repetitive low-level tasks, the space available for higher-

order thinking is compressed (Sweller, 1988)[3]. During the copying-to-creation transition, checking numerous rubbings, comparing forms character by character, and redrawing an entire line to test a particular density effect all consume a great deal of student effort. If AIGC takes over tasks such as matching editions, interpolating structures, and designing layouts, aesthetic reflection gains a place to stand-that is, students can analyse concretely the rhythm of brush momentum along a line, the compatibility of a given brush technique with their own style, and the relation between a single character and the momentum of the whole line. On this logic, the centre of instruction shifts from "writing as the model shows" to "why this variant was chosen, and at what cost."

3. Design and Implementation of the Teaching Framework

On the rationale set out above, a four-stage teaching framework is constructed: genealogy inquiry-variant generation-compositional negotiation-process assessment.

Table 1. Framework of the AIGC-Supported Copying-to-Creation Teaching Process

Teaching Stage	Core Learning Objectives	AIGC Application	Students' Main Tasks
Genealogy Inquiry	Knowledge of calligraphy history, stylistic lineages, comparison of rubbing editions	LLM dialogue and knowledge Q&A	Consult historical sources on calligraphy; compare the features of script types and of different rubbings; build a concept map of aesthetic categories; standardize the use of stylistic terminology
Variant Generation	Analysis of glyph variation; understanding of spatial relations	Image analysis and generative models: glyph parsing and the generation of interpolated variants between two editions of a model	Upload their own practice work; compare it with AI-generated variant comparison charts; identify which features are retained and which are rewritten
Compositional Negotiation	Continuity of line momentum; distribution of density and sparseness; control of overall layout	Brush-movement animations and alternative layout schemes produced by video generation and style-transfer models	Watch dynamic demonstrations; submit a complete learning portfolio; carry out a comparative diagnosis of their own drafts, the models, and the generated variants
Teaching Assessment	Documenting the process; human–AI collaborative assessment	Portfolio-based process-oriented assessment	Organize practice logs, comparison materials, successive drafts, the final work, and a reflective report

3.1. Theoretical Instruction: Large Language Models as Triggers for Reflection

The large language model here should be understood as an interlocutor rather than an answer provider. Students can formulate prompts about a particular calligrapher, stele, copybook, or script type, use follow-up questions to expose gaps in their own knowledge, and then engage in multi-turn discussion. If a student tries to describe the distance between the Duobao Ta Stele and the Yan Qinli Stele with a word such as "mature," the model will press them toward more pertinent concepts-"massive," "unadorned," "expansive"-until they can draw a reasonably precise distinction in terms of both period and aesthetics. Notes taken in class can also be checked by the model to flag mistaken characters or misapplied terminology. At this point the

teacher intervenes as a gatekeeper, paying particular attention to cases in which the model's account of calligraphic history fails to distinguish two rubbings of the same stele or fabricates a source without grounds[6].

3.2. Variant Generation: From Mechanical Replication to Deliberate Deviation

Calligraphy teaching at the creative stage has long been troubled by one difficulty: students can feel that a draft "resembles the model" and yet "is not their own," but cannot say which features have been borrowed and which rewritten. In his research on brush technique, Qiu Zhenzhong observes that the analysis of brushwork must reconstruct "the trajectory of the brush tip inside the stroke" and examine the possible movements available to the brush tip[7]. Approaching the matter through ancient writing posture and the relation between brush, paper, and hand, Sun Xiaoyun emphasizes that the brush methods of the ancients are not abstract formulas but a practical system tightly bound to bodily movement and the conditions of the tools[8]. A variant generated on screen must therefore be handed back to the hand before it can count as a learning event.

The proposal here is to have students describe the features of their own drafts in professional terms: strokes (centered brush / side brush, concealed tip / exposed tip, degree of lifting and pressing), structure (compact / open, slanted / upright), and composition (distribution of density and sparseness, continuity of line momentum). Using image analysis, AIGC produces superimposed outlines, centre-line positions, and several interpolated variants between the written character and the reference model; it compares the draft with the standard glyph at the pixel level and indicates how each feature would need to be displaced to meet the model's standard. The student's self-description can then be set against the basic concepts of traditional calligraphy theory. The generated variants are only hypotheses awaiting verification through actual writing; they cannot substitute for writing itself.

3.3. Assessment: The Portfolio as a Record of the Complete Learning Process

To speak only of results and not of process is the fundamental defect of summative assessment. Portfolio assessment rests on the principle of "the purposeful collection of student work, autonomous selection, and evidence of reflection" (Paulson et al., 1991)[9]. This paper designs assessment as a portfolio-based, process-oriented method and specifies the materials to be collected: dated practice sheets and the associated AI comparison images, interpolation samples selected at each stage, successive revised drafts, and reflective notes explaining "why one variant was kept and another discarded." The overall course grade comprises four components: a genealogy analysis report (20%), practice logs (30%), copied or original works (30%), and aesthetic reflection (20%). These weights state plainly that the path matters more than any single finished piece, and the reasoning behind a decision more than the decision itself.

3.4. Observed Outcomes

The model was implemented with 48 calligraphy majors in a 48-contact-hour course, "Running Script: Copying and Creation," at the author's university. Observation over one complete teaching cycle yielded the following results.

First, the interval between a draft and its diagnosis changed from "wait until the next class" to "completed in the same session"; group discussions acquired visual evidence, and both the frequency and the quality of classroom interaction improved. Second, students gradually abandoned vague phrases such as "still not quite like the model" and began to use precise terminology with confidence-"the centered brush is retained," "the upper structure is tightened," "the line momentum breaks in the middle"-a terminological system that itself derives from the systematic account of brushwork in traditional calligraphy theory[7, 8]. Third, all 48 students completed no fewer than three rounds of variant generation and handwritten verification within class hours and built learning portfolios containing no fewer than six

iteration records; this density of documented decision-making is difficult to achieve under the traditional teaching model.

4. Risks and Mitigation Strategies

The first risk is stylistic homogenization. In conditional generation, AIGC tends to regress toward the statistical centre of its training corpus, so even when every variant produced is plausible, the results are likely to settle into a smooth, unremarkable average. If variants are treated as settled facts rather than hypotheses, a student's individual brush character is unlikely to survive. The remedy is to make "deviation" a compulsory task: each student must single out some generated feature they reject, explain in technical terms why, and then write out the relevant passage by hand. In grading, "traces the model cannot produce" earn credit rather than incur a penalty.

The second is the hollowing-out of humanistic content. AI can reproduce the forms of a script being imitated with high fidelity, but it cannot feel the restrained sorrow of Su Shi's Huangzhou Cold Food Poems, nor discern the ordered sense of fa (canonical method) on which Ouyang Xun's regular script depends. In A History of Chinese Calligraphy, Huang Dun and his co-authors note that Tang regular script is marked by a distinctive tradition of "esteeming fa"[6]; analysis of Song calligraphy further shows that literati had absorbed script into the expression of their own circumstances and cultivation. Generated variants possess form only; they have no situation behind them. Instruction should therefore require a brief account of every choice made by AI, giving an explanation in terms of period and emotion, so that formal exploration is joined to cultural understanding.

The third is distortion in generated content. In calligraphic history, so-called LLM "hallucinations"-fabricated theories of calligraphy, confused dates for steles and copybooks, rubbings misidentified as other carved stones, and styles attributed to the wrong hands-are already well documented in practice, and such erroneous genealogies can covertly affect every variant derived from them. Instruction should set a basic rule: "AI output may enter the portfolio only after a human has verified it against published sources." Students should also be required to record the edition, page, and catalogue number of any plate they consult. On matters of historical fact, final authority remains with the teacher, not the model[4].

5. Conclusion

AIGC has entered the university calligraphy classroom; the question is no longer "whether to use it" but "how to use it." The teaching process constructed here integrates four elements into a coherent whole: large language models that assist with knowledge, image generation models capable of visual analysis, multimodal dynamic demonstration, and portfolio-based process-oriented assessment. Its distinctive contribution is to fill the long-neglected middle ground between copying and creation. Practice shows that when a generated image is treated as a question put to the hand rather than an answer delivered to the eye, technology does not dilute the rigour of brushwork training; on the contrary, it makes the decisions behind a work visible, discussable, and teachable. The proper stance for calligraphy education in the AI era is neither rejection nor uncritical adoption, but human–machine collaboration: the model supplies comparable possibilities, the teacher supplies judgement, and the student supplies the hand.

Acknowledgments

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References

[1] Chen, Z. (1992). *Calligraphy Pedagogy*. Xiling Seal Art Society Press. (in Chinese)

[2] Sha, M. (1997). *Sha Menghai's Collected Essays on Calligraphy*. Shanghai Calligraphy and Painting Publishing House. (in Chinese)

[3] Sweller, J. (1988). Cognitive load during problem solving: effects on learning. *Cognitive Science*, 12(2), 257–285.

[4] Luckin, R., Holmes, W., Griffiths, M., et al. (2016). *Intelligence Unleashed: An Argument for AI in Education*. Pearson.

[5] Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes* (M. Cole et al., Eds.). Harvard University Press.

[6] Huang, D., Jin, D., Zhu, A., & Zhu, T. (2001). *A History of Chinese Calligraphy*. Liaoning Fine Arts Publishing House. (in Chinese)

[7] Qiu, Z. (2012). *Brush Technique and Composition*. Jiangxi Fine Arts Publishing House. (in Chinese)

[8] Sun, X. (2001). *Calligraphy Has Its Method*. Huayi Publishing House. (in Chinese)

[9] Paulson, F. L., Paulson, P. R., & Meyer, C. A. (1991). What makes a portfolio a portfolio? *Educational Leadership*, 48(5), 60–63.