

Development and Pilot Evaluation of an Instructional Model Integrating Metacognition Theory and Collaborative Learning for English Writing Instruction among Chinese Non-English Major Undergraduates

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Received January 29, 2026; **Revised** March 4, 2026; **Accepted** March 22, 2026

Abstract

This study aimed to: 1) develop an instructional model integrating Metacognition Theory and the Collaborative Learning Approach to support English writing instruction for non-English major undergraduates in China, and 2) conduct a pilot evaluation of the developed instructional model based on expert evaluation and supporting evidence from pilot implementation. The model, structured across Pre-Writing, While-Writing, and Post-Writing phases, was implemented over a two-week intervention with 50 first-year non-English majors who were enrolled in the first semester of 2025 at a Chinese university, selected via purposive sampling. A one-group pre-test/post-test design was employed. Data were collected through expert evaluation forms and English writing tests, analyzed using descriptive statistics and a paired-samples t-test. The research results are as follows: 1) Expert validation confirmed the model's high appropriateness ($M = 4.47$, $SD = 0.76$). 2) The pilot implementation demonstrated a statistically significant improvement in students' writing performance, with post-test scores ($M = 68.7$, $SD = 8.2$) surpassing pre-test scores ($M = 62.3$, $SD = 9.5$), $t(49) = 5.80$, $p < .001$. Pedagogically, the model fostered enhanced self-regulated learning, evidenced by more systematic planning, ongoing self-monitoring, and reflective revision, facilitated through structured peer interaction. The findings provide preliminary evidence that the integrated model, by cultivating metacognitive

strategies and collaborative engagement, can enhance English writing ability, offering a promising alternative to traditional instructional practices.

Keywords: EFL Writing; Metacognitive Strategies; Collaborative Learning; Chinese Higher Education; Instructional Design.

Introduction

With English as a compulsory subject throughout formal education, China hosts one of the largest EFL populations globally (Hu, 2005). Despite this scale of instruction, attaining proficiency in academic writing remains a particularly acute and persistent challenge for Chinese university undergraduates, consistently identified as a critical area of weakness (Wei & Su, 2012).

The root of this challenge lies in the pedagogical constraints of the prevailing instructional model. Research indicates that writing instruction remains predominantly product-oriented, focusing on the correction of final drafts rather than scaffolding the writing process itself. This approach often leads to passive learning, where students lack the strategic awareness to plan, monitor, and evaluate their own work—a deficiency directly linked to the absence of explicit metacognitive training. Furthermore, the traditional teacher-centered classroom offers limited opportunities for meaningful peer interaction, resulting in low motivation and a lack of social support that could foster idea development and critical reflection (Chen, 2018).

To address these specific shortcomings, an integrated theoretical framework combining Metacognition and Collaborative Learning is proposed as a targeted intervention. Metacognitive theory (Flavell, 1979) provides the internal mechanism to counteract passivity by equipping learners with strategies for self-regulated learning throughout the writing process. Concurrently, Collaborative Learning, grounded in social constructivism (Vygotsky, 1978), directly tackles the issue of isolated learning by creating a community of practice where peers provide scaffolding, motivation, and authentic audiences for drafting and revision. The synergy of these approaches is key: collaborative tasks offer a social context where metacognitive processes are externalized, modeled, and refined through dialogue.

Therefore, this study aims to develop and pilot-evaluate an instructional model integrating Metacognition Theory and a Collaborative Learning Approach. The research seeks to answer the following questions: (1) What is a valid and appropriate instructional model for teaching English writing that integrates Metacognition Theory and a Collaborative Learning Approach? (2) To what extent does the pilot implementation of this model impact the English writing performance of

Chinese undergraduates? By addressing these questions, the study intends to contribute a theoretically coherent and pedagogically actionable framework to the field of EFL writing instruction.

Research Objectives

1 . To develop an instructional model integrating Metacognition Theory and the Collaborative Learning Approach to support English writing instruction for non-English major undergraduates in China.

2. To conduct a pilot evaluation of the developed instructional model based on expert assessment and supporting evidence from pilot implementation.

Literature Review

Metacognition Theory in Writing Development

Writing is a complex cognitive activity that extends beyond linguistic expression to involve continuous self-regulation. Metacognition, defined as an individual's knowledge and control over their own cognitive processes (Flavell, 1979), provides the foundational framework for understanding this self-regulation. In writing pedagogy, metacognition is commonly conceptualized along two interrelated dimensions: metacognitive knowledge (awareness of one's strategies, tasks, and abilities) and metacognitive regulation (the active control of planning, monitoring, and evaluating during the writing process). This study is grounded primarily in Flavell's (1979) Metacognition Theory, which operationalizes metacognition into cyclical phases—planning, monitoring, and evaluating—aligning closely with the recursive stages of composition.

Empirical research robustly supports the integration of metacognitive strategies into writing instruction. For EFL learners, explicit metacognitive training is particularly crucial, as it fosters greater autonomy and compensates for potential limitations in linguistic knowledge by enhancing strategic competence. Recent research (Teng & Zhang, 2021) has evolved beyond merely listing strategies (planning, monitoring, evaluating) to investigate their conditional effectiveness. Key findings indicate that while tools like planning checklists and reflection journals improve textual organization and revision awareness, their success is mediated by factors such as learners' proficiency level and, critically, the instructional framing. Isolated strategy training often fails to sustain self-regulation, pointing to a need for embedding metacognition within meaningful, socially situated tasks.

Therefore, in the context of instructional design, metacognitive theory provides a structural basis for embedding explicit planning, monitoring, and reflection phases within writing tasks. These components are essential for constructing a systematic model rather than implementing isolated strategies. To move from theory to practice, key metacognitive components must be operationalized into tangible pedagogical tools. In the context of developing a systematic writing model, this entails the design of structured supports such as planning checklists to guide the forethought phase, guided revision prompts to facilitate monitoring during drafting, and reflective journals or self-assessment rubrics to institutionalize the evaluation phase. These tools are essential for translating abstract regulatory processes into teachable and learnable classroom activities, forming the cognitive pillar of the proposed integrated instructional model.

Collaborative Learning in Writing Instruction

Collaborative Learning (CL) is an instructional approach rooted in social constructivism, positing that knowledge is co-constructed through social interaction and dialogue (Vygotsky, 1978). In writing instruction, CL is often operationalized through collaborative writing and structured peer feedback activities. In these setups, learners work in small groups or pairs to plan, draft, and revise texts, engaging in negotiation, explanation, and mutual support (Storch, 2005; Johnson & Johnson, 2018). This process transforms the classroom into a community of practice where learners scaffold each other's development within their Zone of Proximal Development.

The benefits of CL for writing development are well documented. Evidence confirms CL's benefits for improving linguistic accuracy, idea development, and audience awareness. However, studies also identify persistent challenges: uneven participation, social loafing, and the provision of superficial, often only corrective, feedback. The quality of collaborative outcomes is heavily dependent on structured protocols, training, and task design, suggesting collaboration alone is insufficient without guided processes. Furthermore, implementing effective CL in Chinese EFL contexts requires navigating specific cultural and pedagogical realities. Challenges include a traditional teacher-centered ethos, large class sizes, exam-oriented pressures, and social norms concerning "face," which may inhibit students from openly critiquing peers' work. These factors underscore the necessity for carefully structured CL tasks with clear protocols, role assignments, and training in constructive feedback to mitigate hesitation and maximize productive interaction.

In conclusion, collaborative learning can improve linguistic accuracy through real-time peer feedback and editing, strengthen organization via co-constructing outlines and analyzing textual structures, deepen argumentation by engaging students in group debates and collaborative

reasoning and foster metacognitive awareness as learners articulate their writing choices and evaluate strategies together. By designing targeted collaborative tasks, such as peer revision circles or joint outline workshop, educators can directly link interactive learning processes to measurable gains in these specific writing outcomes.

Synthesizing the Gap: Integration and Context

The preceding review establishes metacognitive theory and collaborative learning as robust, independent foundations for writing instruction. Research confirms the efficacy of metacognitive strategies for fostering self-regulation (Zimmerman, 2002) and the benefits of collaborative environments for enhancing feedback and task engagement (Storch, 2005). Scholars have further theorized their synergistic potential, where collaborative dialogue provides the social material for metacognitive reflection, and heightened metacognitive awareness, in turn, enriches the quality of peer interaction (Donato, 2004; Oxford, 2017).

Despite this complementary potential, a significant, multi-layered research gap persists, justifying the present study: 1) Theoretical Gap: The two approaches are often studied independently. Few studies construct a systematically integrated instructional framework. 2) Pedagogical Gap: Lack of operationalized model integrating metacognitive regulation cycles and structured collaborative mechanisms. 3) Contextual Gap: Limited empirical model-based intervention studies in Chinese higher education among non-English majors. A consequential contextual gap in policy-driven writing reform exists between mandating collaborative learning and specifying its operationalization for improving discrete skills (e.g., argumentation, accuracy), leading to superficial adoption rather than targeted writing development. This contextual gap highlights a critical need for locally situated design-based research.

Therefore, this study aims to address this threefold gap by developing and piloting an integrated instructional model, thereby contributing a theoretically coherent and pedagogically operational framework tailored to the needs of Chinese undergraduate EFL writing instruction.

Conceptual Framework

This study is a pedagogical model development study, and the conceptual framework integrates Metacognition Theory (Flavell, 1979) and Collaborative Learning Approach (Vygotsky, 1978) to develop a pedagogical model for writing instruction. It specifically adopts the constructions of Metacognitive Knowledge (factual, procedural, conditional), Metacognitive Regulation (planning, monitoring, evaluating), and the collaborative principles of Positive Interdependence, Promotive

Interaction, Individual & Group Accountability, Social Skills and Group Processing. The core integrative mechanism posits that collaborative interaction provides external cognitive stimulation; Peer feedback triggers metacognitive monitoring; Metacognitive reflection deepens collaborative engagement; Structured collaboration creates opportunities for strategic regulation. This theoretical synergy directly informs a three-phase instructional model (pre-writing, while-writing, post-writing) designed to systematically translate theory into classroom practice. Consequently, the framework provides the logical blueprint for developing the model (Objective 1) and establishes the criteria—feasibility, coherence, and mechanism engagement—for its pilot evaluation (Objective 2), with the ultimate outcome of enhancing English writing proficiency.

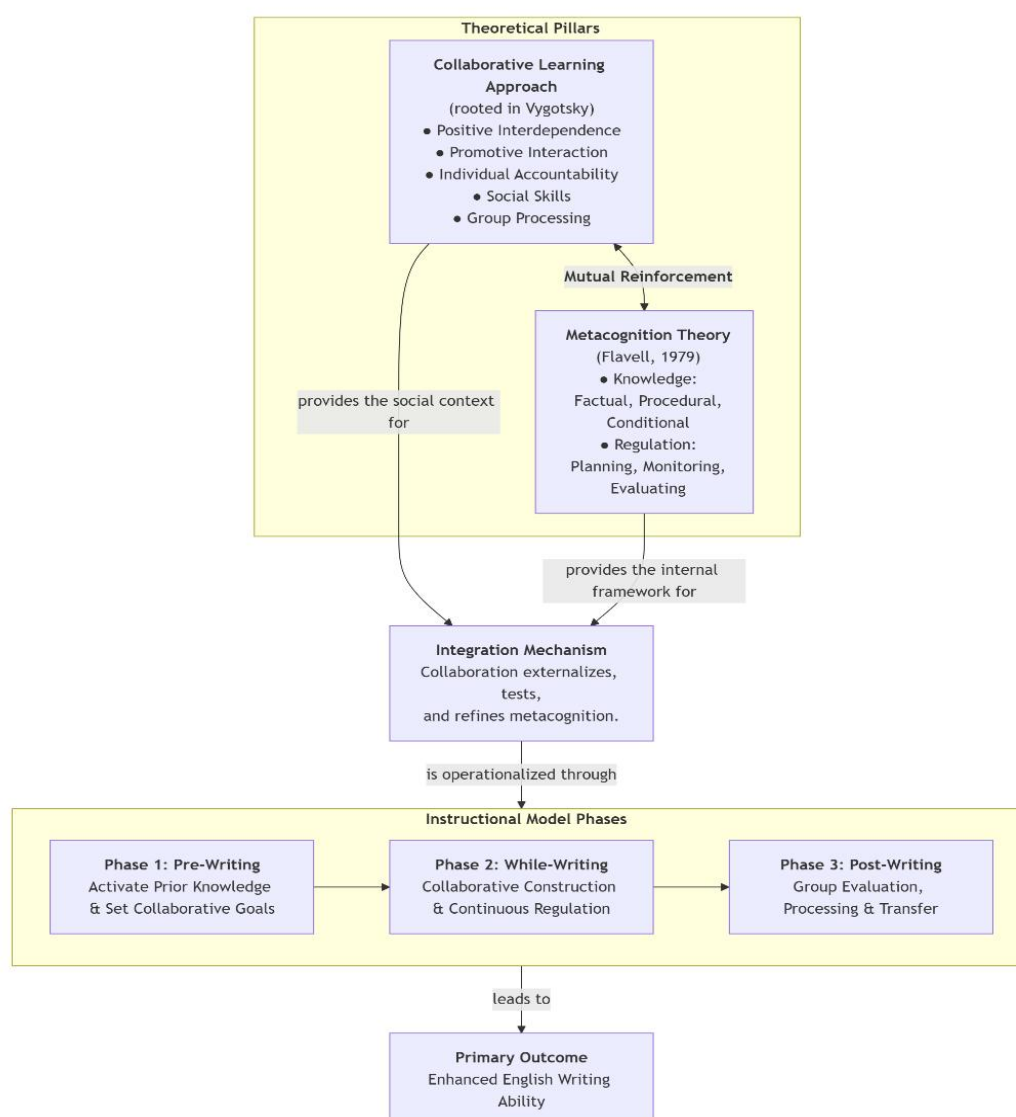


Figure 1 Conceptual Framework

Research Methodology

This study employed a two-phase research design aligned with Design and Development Research (DDR) principles, integrating model creation with preliminary evaluation. Phase I focused on theoretical synthesis and needs analysis to develop the instructional model, while Phase II implemented a one-group pretest-posttest quasi-experimental pilot to evaluate its feasibility and gather preliminary evidence of effectiveness. The study received ethical approval from the Graduate Udon Thani Rajabhat University (Approval No: HECUD.136/2025), and informed consent was obtained from all participants.

Phase I: Model Development

This phase consisted of two components: theoretical synthesis and needs analysis.

Participants for Needs Analysis:

Participants were selected through purposive sampling. Five experts were selected through purposive sampling based on the following criteria: (a) doctoral qualification in English language education or instructional design, (b) at least five years of university-level teaching experience, and (c) prior research or publication in writing instruction or pedagogy. Five in-service EFL writing teachers who were recruited from the target university. Fifty first-year undergraduate students enrolled in the compulsory English writing course constituted a single intact class, representing a convenience sample for the initial needs assessment (Mean age = 18.7, SD = 0.8; 32 females, 18 males).

Instruments and Validation:

A needs analysis questionnaire was developed based on the theoretical constructions. It comprised 25 items across four dimensions: metacognitive awareness in writing (7 items), experience with collaborative writing tasks (6 items), perceived writing difficulties (7 items), and instructional preferences (5 items), using a 5-point Likert scale (1=Strongly Disagree to 5=Strongly Agree). Five experts evaluated the questionnaire for content validity, yielding an average Item-Content Validity Index (I-CVI) of 0.92. The internal consistency reliability of the questionnaire was examined using Cronbach's alpha ($\alpha = .87$).

Procedures:

Following a systematic review of Metacognition and Collaborative Learning theories, the questionnaire was administered online via the Questionnaire Star platform. Questionnaire results were analyzed to identify key challenges in students' writing (e.g., lack of planning strategies, limited revision skills, insufficient peer interaction). Qualitative analysis of open-ended responses

further contextualized these needs. These findings were mapped onto metacognitive regulation components and collaborative learning principles to construct the initial instructional model. Subsequently, eight corresponding lesson plans and parallel pre–post writing tests with an analytic rubric were drafted.

Phase II: Model Validation (Pilot Study)

As this study aimed to conduct a pilot evaluation, a one–group pretest–posttest design was adopted to provide preliminary evidence of effectiveness before large–scale implementation.

Participants:

A new panel of five independent experts (different from Phase I), meeting the same high qualification criteria, evaluated the model and instruments. The same intact class of 50 first–year students participated in the two–week pilot implementation during the September 2025 semester. Participation was voluntary and informed consent was obtained.

A future, full–scale study is recommended to employ a quasi–experimental design with a control group and a longer intervention period (e.g., 8–12 weeks).

Instruments and Validation:

Expert Evaluation Forms: Separate 5–point Likert scale forms assessed the model’s appropriateness (covering theoretical alignment, practicality, and coherence) and the lesson plans’ suitability. The Scale–Content Validity Index (S–CVI/Ave) for both forms was 0.94.

Writing Tests and Scoring Rubric: Parallel pre– and post–test prompts required a 3–paragraph argumentative essay of equivalent complexity. The analytic rubric (adapted from CET–4 writing test) assessed content (40 points), accuracy (30 points), cohesion (30 points), (Total=100 points). Two trained raters independently scored all essays using the analytic rubric. Inter–rater reliability was calculated using intra–class correlation coefficient ($ICC = .91$), indicating high agreement.

Procedures:

First, experts independently evaluated the model and instruments. Next, the pilot study was conducted. After the pre–test, the instructor delivered eight 90–minute lessons over two weeks, implementing the full three–phase model (Pre–, While–, Post–writing) with metacognitive and collaborative activities. The two–week duration was designed as a preliminary feasibility and short–term effectiveness trial prior to extended implementation. If possible, the duration of the intervention would be extended to 8–12 weeks in future studies. The post–test was administered immediately after the intervention.

Data Analysis:

Expert evaluation data were analyzed using means and standard deviations. Students' pre- and post-test scores were compared using a paired-samples t-test in SPSS 26.0, after confirming normality of score differences via the Shapiro-Wilk test ($p > .05$). The effect size was calculated using Cohen's d to interpret the practical significance of any observed differences. A paired-samples t-test revealed significant improvement, $t(49) = 5.8$, $p < .001$, Cohen's $d = .82$ (large effect).

Research Results

Development of the writing instructional model based on metacognition and collaborative learning

Informed by established theoretical frameworks and a systematic analysis of prevalent needs in English writing instruction, a six-component instructional model was iteratively developed. The construction of each component was directly guided by quantitative and qualitative data from the needs analysis phase, ensuring alignment with specific metacognitive constructs (knowledge, regulation, experience) and collaborative learning mechanisms.

Theoretical framework

Theoretical framework is composed of the integration of Metacognition Theory and the Collaborative Learning Approach. This dual framework was synthesized to address two core deficiencies identified in the needs analysis. Metacognition Theory was incorporated to target students' significant lack of self-regulatory strategies (e.g., planning, monitoring, and evaluating their writing, as indicated by high-mean questionnaire items). Collaborative Learning Approach was integrated to counteract the isolated nature of writing practice reported by students, leveraging peer interaction to externalize and scaffold metacognitive processes, thereby creating a community of practice for shared regulation.

Teaching principles

Teaching principles include reflection and adjustment, cooperation and interaction which were operationalized from specific gaps. The principle of "Reflection and Adjustment" was formulated in direct response to the high-priority need for revision strategies (e.g., "I need methods to systematically review my drafts," Mean = 4.3). Therefore, structured reflective checkpoints were embedded in each lesson to operationalize metacognitive regulation. The principle of "Cooperation and Interaction" was established based on the expressed demand for

collaborative learning (e.g., “Learning from peer feedback is helpful,” Mean = 4.1), guiding all interactive task designs to foster collective knowledge building.

Teaching objectives

Students can master and apply effective writing strategies to improve their writing quality. Students will be able to apply planning strategies (e.g., brainstorming, outlining) before drafting. Students will demonstrate improved textual coherence by appropriately using transitional devices. Students will revise drafts systematically using structured peer–feedback protocols and self–assessment checklists.

Teaching content

Lesson 1: Deaf DJ

Lesson 2: Janitor Filipaj, the Dream Pursuer

Lesson 3: All Grown Up and Still in Tow

Lesson 4: Learning to Make a Difference

Lesson 5: Guardians of Dunhuang

Lesson 6: Zhan Tianyou, Father of China’s Railroad

Lesson 7: 14 Days with (Almost) No Internet: Did My Digital Detox Pay Off?

Lesson 8: My Smartphone: A Letter of Hate, Love and Balance

The above eight thematic lessons covered descriptive, argumentative, and compare & contrast essays. Topics were selected not only for genre coverage but also for their potential to elicit personal reflection and group discussion, thereby providing authentic content for practicing metacognitive and collaborative strategies identified as needed.

Teaching steps

Teaching steps are composed of a five–stage cycle (Pre–writing: Steps 1–3; While–writing: Step 4; Post–writing: Step 5). Each step was designed to operationalize specific constructions. Step 1–3 (Diagnosis): These stages diagnose and activate metacognitive knowledge. Factual knowledge (e.g., genre conventions) was diagnosed through a short diagnostic writing task and concept–mapping activity. Procedural knowledge (e.g., “how to write a thesis”) was assessed through think–aloud protocols in small groups. Conditional knowledge (e.g., “when to use a specific strategy”) was explored through guided group discussions on sample texts. Step 4 (Collaborative Writing): This step operationalizes collaborative learning and shared regulation. Students co–construct outlines, draft paragraphs, and provide real–time feedback in structured pair/group tasks. Step 5 (Conclusion & Evaluation): This step emphasizes metacognitive regulation through

structured peer-evaluation using a rubric, followed by guided self-assessment and individual reflection journaling on the writing process.

Evaluation mode

To align with the model's theoretical foundation, the final product evaluation (a timed essay scored 40/30/30 for Content, Linguistic Accuracy, and Coherence & Cohesion) was supplemented with process-oriented evaluation. This includes scoring of peer-feedback quality, self-assessment accuracy, and reflection journal entries, ensuring the assessment captures growth in metacognitive and collaborative skills, not just final linguistic output.

In summary, the finalized instructional model consisted of six interrelated components systematically aligned with metacognitive knowledge, regulation, and cooperative learning principles.

Validation of the writing instructional model based on metacognition and collaborative learning

Experts' Evaluation

The writing instructional model was evaluated by five experts in the aspects of consistency of the components and the appropriateness of the component descriptions.

Table 1 Expert Evaluation of the Instructional Model

No	Assessment Items	$\bar{x}$	S.D.	Interpretation
1	Theoretical Framework of the Model			
	1.1 The model is grounded in well-established educational theories (e.g., metacognition, collaborative learning).	4.60	0.80	highest level
	1.2 The framework aligns with current research on enhancing English writing skills.	4.40	0.80	high level
Total average mean score: Theoretical Framework of the Model		4.50	0.81	high level
2	Teaching Principles of the Model			
	2.1 The principles emphasize metacognitive strategies (e.g., planning, self-monitoring).	4.60	0.80	highest level
	2.2 Collaborative learning is systematically integrated into instructional design.	4.40	0.80	high level
Total average mean score: Teaching Principles of the Model		4.50	0.81	high level

No	Assessment Items	$\bar{x}$	S.D.	Interpretation
3	Teaching Objectives of the Model			
	3.1 Objectives are clear, measurable, and aligned with students' writing needs.	4.60	0.80	highest level
	3.2 Objectives balance language accuracy, creativity, and critical thinking.	4.40	0.80	high level
Total average mean score: Teaching Objectives of the Model		4.50	0.81	high level
4	Teaching Contents of the Model			
	4.1 Content is relevant to students' real-life challenges in English writing.	4.60	0.80	highest level
	4.2 The Contents of the model is aligned with the instructional goals and can effectively achieve learning outcomes.	4.40	0.80	high level
Total average mean score: Teaching Contents of the Model		4.50	0.81	high level
5	Teaching Steps of the Model			
	5.1 Steps are logically structured (pre-writing, collaborative writing, reflection).	4.40	0.80	high level
	5.2 Steps promote active student engagement and peer interaction.	4.60	0.49	highest level
Total average mean score: Teaching Steps of the Model		4.50	0.67	high level
6	Evaluation mode of the Model			
	6.1 Evaluations are comprehensive (content, language, coherence).	4.40	0.49	high level
	6.2 Feedback mechanisms support continuous improvement.	4.20	0.75	high level
Total average mean score: Evaluation mode of the Model		4.30	0.64	high level
Total average mean score		4.47	0.76	high level

The instructional model received quantitative validation from five experts, with high ratings across all components (Total $M=4.47$, $SD=0.76$), as detailed in Table 1. More importantly, their qualitative feedback provided crucial insights for iterative refinement. A thematic analysis of their open-ended comments revealed two primary areas for enhancement, which were subsequently integrated into the final model. Experts suggested making the metacognitive regulation process more visible within the teaching steps. For instance, one expert noted, "The link between collaborative activities and specific metacognitive strategies (e.g., peer feedback serving as an external monitor) could be made more explicit for learners." In response, the teaching guides were revised to include clear metacognitive prompts at each stage of the collaborative writing cycle (e.g., "After reviewing your partner's outline, articulate one strategy they used for organization that you could apply."). While endorsing the mixed evaluation mode, experts recommended further operationalizing the criteria for assessing process skills. Based on feedback such as, "The scoring rubrics for reflection journals should distinctively capture the depth of self-regulation, not

just completion,” we developed analytical rubrics for peer-feedback quality and reflective journals, focusing on criteria like specificity of suggestions and depth of self-critique. This synthesis of high quantitative ratings and constructive qualitative critique confirms the model’s theoretical soundness, practical applicability, and capacity for improvement based on expert input.

Pilot Study

Quantitative Improvement in Writing Performance

The pilot implementation with 50 students demonstrated statistically significant improvement in writing scores. As shown in Table 2, post-test scores ($M=68.7$, $SD=8.2$) were significantly higher than pre-test scores ($M=62.3$, $SD=9.5$), with a large effect size (Cohen’s $d=0.82$).

Table 2 Summary of Pre-Test and Post-Test Scores for Pilot Group ($n=50$)

Measure	n	M(SD)	t	df	Mean Difference [95% CI]	Cohen’s d [95% CI]
Pre-Test	50	62.3 (9.5)	—	—	—	—
Post-Test	50	68.7 (8.2)	—	—	—	—
Difference	—	6.40 (7.8)	5.80	49	6.40 [4.20, 8.60]	0.82 [0.41, 1.23]

Note. *** $p < .001$. Paired samples t -test; $df = 49$ ($n-1$); Effect size interpretation: $d = 0.82$ (large effect per Cohen, 1988).

To further investigate the model’s differential impact on specific writing skills, a detailed analysis of the three sub-dimensions was conducted. The results of paired-samples t -tests for each sub-dimension are presented in Table 3. As shown in Table 3, the intervention led to statistically significant and substantial improvements in the Content and Coherence & Cohesion dimensions. The score for Content increased significantly from $M= 24.5$ to $M=27.7$, $t(49) = 5.5$, $p < .001$, with a large effect size ($d= 0.79$). Similarly, Coherence & Cohesion scores showed a significant gain from $M= 18.8$ to $M= 21.3$, $t(49) = 4.8$, $p < .001$ ($d= 0.68$). In contrast, the improvement in Linguistic Accuracy was minimal and not statistically significant from $M= 19.0$ to $M= 19.7$, $t(49) = 1.2$, $p= .237$, $d= 0.17$. This pattern of results indicates that the integrated model was particularly effective in enhancing higher-order writing skills related to idea development and textual organization, which were directly facilitated by metacognitive planning and collaborative peer review focused on structure and arguments. The modest gain in linguistic accuracy suggests that a two-week intervention may be insufficient for systemic grammatical improvement, which might require longer-term or more focused practice.

Table 3 Paired-Samples t-test Results for Writing Sub-Dimensions (n=50)

Writing Sub-Dimension	Pre-test M (SD)	Post-test M (SD)	Mean Difference (ΔM)	<i>t</i>	<i>p</i>	Cohen's <i>d</i>
Content (Max=40)	24.5 (4.2)	27.7 (3.8)	+3.2	5.50	<.001	0.79
Coherence & Cohesion (Max=30)	18.8 (3.5)	21.3 (3.0)	+2.5	4.80	<.001	0.68
Linguistic Accuracy (Max=30)	19.0 (4.1)	19.7 (3.9)	+0.7	1.20	>.05	0.17
Total Score (Max=100)	62.3 (9.5)	68.7 (8.2)	+6.4	5.80	<.001	0.82

Qualitative Analysis of Student Feedback

Content analysis of student reflection journals and post-intervention questionnaires yielded rich qualitative data, highlighting the model's impact on the learning process and attitude. Students frequently described how collaboration altered their approach. One student reflected, "Discussing my draft with peers was nerve-racking at first, but their questions showed me where my ideas were unclear. It wasn't just about correcting grammar anymore." This shift from viewing writing as a product-focused, isolated task to a process-oriented, social activity was widely reported. Many students reported newly acquired or more systematic use of planning and revision strategies. For example, a student noted, "I now use the 'reverse outline' checklist after my first draft. Before, I would just submit it. I finally understand what 'revising for structure' means." This indicates the internalization of metacognitive regulation strategies. Students expressed a changed perception of peer interaction. Comments like, "Giving feedback helped me as much as receiving it. When I had to explain why a sentence was awkward, I started avoiding the same mistake in my own writing," underscore the reciprocal learning embedded in the collaborative design.

Discussions

This study developed and validated an instructional model integrating metacognition and collaborative learning, which demonstrated significant effectiveness in enhancing Chinese undergraduates' English writing, as evidenced by a substantial score gain ($\Delta M=6.4$, $d=0.82$). Crucially, this discussion moves beyond restating results to interpret why and how the model worked.

The significant improvement, particularly in content and coherence, can be attributed to the model's targeted synergistic mechanism. It systematically addresses common challenges in the Chinese EFL context. First, the structured collaborative tasks (e.g., peer feedback protocols, group

outlining) create a low-stakes, rule-governed social space for intellectual exchange. This design helps mitigate cultural hesitancy towards open critique and “losing face” by formalizing peer interaction as a necessary, guided step in the process, not a personal judgment. Second, the embedded metacognitive components (e.g., planning checklists, reflection journals) translate these social interactions into internalized self-regulation strategies. Peer feedback becomes a mirror for one’s own work, and group discussions scaffold individual planning and monitoring. This synergy between external social mediation and internal cognitive regulation operationalizes Vygotsky’s (1978) concept of internalization through social interaction and Zimmerman’s (2000) cyclical self-regulation model.

The pattern of results greater gains in higher-order skills (content, coherence) over linguistic accuracy further illuminates the mechanism. The model’s strength lies in its process-oriented focus on ideation and organization, facilitated by collaborative brainstorming and metacognitive review of structure. This directly contrasts with traditional, product-focused approaches that often prioritize grammatical accuracy. The findings align with Reynolds and Teng’s (2023) meta-analysis but extend it by specifying that the combination is particularly effective for developing rhetorical and conceptual competence in learners.

New Knowledge from Research

This research contributes new, context-specific knowledge to TESOL and L2 writing pedagogy. It demonstrates that an integrated metacognitive-collaborative model is not merely effective in general but is specifically potent in addressing the paradigm shift from product- to process-oriented writing instruction in contexts like China’s higher education. The primary contribution is a validated framework that successfully transforms writing from a solitary, teacher-centered exercise into an active, socially mediated, and self-regulated learning process. The study empirically confirms that such a model can overcome specific contextual barriers (e.g., passive learning habits, reluctance to peer critique) by providing clear social and cognitive scaffolds. The “new knowledge” lies in the detailed blueprint of how to intertwine collaborative structures with metacognitive prompts to foster this shift, offering a replicable model for similar educational settings.

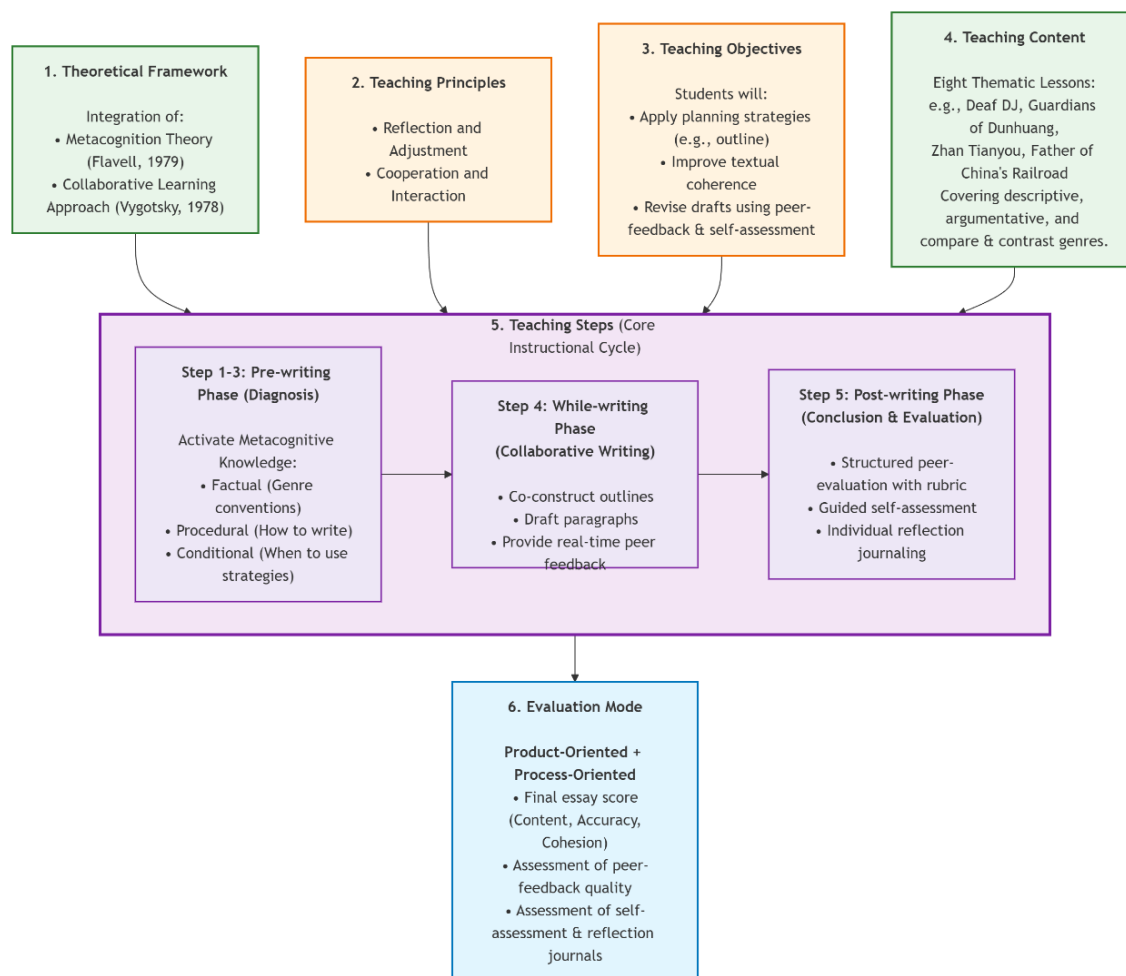


Figure 2 The Integrated Instructional Model

Conclusion

The primary contribution of this research is to offer a structured, evidence-based framework that facilitates a paradigm shift in Chinese EFL writing pedagogy from a traditional, product-centric, and teacher-dominated approach to a dynamic, process-oriented, and student-empowering practice. By deliberately designing learning environments that combine social co-regulation through structured peer interaction with explicit training in individual metacognitive strategies (planning, monitoring, evaluation), the model cultivates more strategic, confident, and proficient L2 writers. It should be noted that the findings are based on a pilot study with a single-group design and a relatively short intervention period. Therefore, while the results are promising, they establish preliminary evidence for the model's potential rather than definitive proof of causality. Future large-scale and longitudinal research is warranted to confirm and extend these findings.

Ultimately, this integrated model underscores the pedagogical importance of addressing both the cognitive and social dimensions of writing, providing a viable and innovative alternative to enrich English writing instruction in higher education contexts similar to China's.

Suggestions

For practice, educators are encouraged to adopt this model's framework, paying particular attention to structuring collaborative tasks to reduce anxiety and explicitly teaching metacognitive strategies within social activities.

For research, future studies should implement this model in a larger-scale, controlled experimental design to strengthen causal claims and explore its long-term effects. Additionally, research could investigate its differential impact across proficiency levels and its adaptability to other skill areas like speaking or critical reading.

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