



Designing Multimodal Writing Assessments for Beginner Chinese Learners

为初学者设计多模态汉语写作评估

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Abstract: This classroom-based study investigates how structured multimodal writing tasks can support beginner learners of Chinese. Four tasks—vocabulary matching, image-supported sentence writing, gap-fill completion, and sentence reordering—were designed to gradually increase cognitive load and reduce external support. Ten first-year undergraduates completed these tasks at the end of a semester-long Chinese elective. Data sources included written outputs, Padlet logs, student reflections, and interviews. Tasks that combined visual cues with sentence-level scaffolds led to more confident and accurate writing. In contrast, grammar-heavy tasks with minimal support resulted in lower accuracy and increased cognitive overload. Drawing on cognitive load theory and dual coding theory, the study proposes a three-phase model: perceptual support, linguistic scaffolding, and output assessment. A rubric assessing language accuracy, content coherence, and peer interaction demonstrated strong inter-rater reliability ($\kappa = .82$). The findings offer practical insights into how multimodal tools can be used to scaffold sentence-level writing and provide low-tech assessment alternatives for under-resourced classrooms. The model can be adapted across various proficiency levels and teaching contexts.

Keywords: multimodal writing, beginner Chinese, sentence-level assessment, cognitive load, scaffolding

To cite this article: Xinsheng, C. (2025). Designing Multimodal Writing Assessments for Beginner Chinese Learners. *Journal of Chinese Language and Culture Studies*, 4(1), 10.17977/um073v4i12025p40-51.

Submit: 6 May 2025

Revised: 14 May 2025

Accepted: 1 June 2025

摘要: 本研究探讨多模态写作任务如何支持初级阶段汉语学习者的句子写作能力。设计了词汇匹配、图像辅助造句、填空完成和句子重组四类任务，逐步提升认知负荷并减少外部支架。十名大一学生在学期末完成所有任务，数据来源包括书面产出、Padlet 互动记录、反思单与访谈。结果显示，图像与句型支架结合的任务有助于提高写作准确性和信心；而缺乏支架的语法重组任务则

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导致准确率下降、认知负担上升。基于认知负荷理论与双编码理论，本文提出“感知支持—语言支架—输出评估”三阶段模型，并构建了涵盖语言准确度、内容连贯性与互动投入的评分量表（ $\kappa = 0.82$ ）。研究结果为资源有限课堂提供了多模态写作评估的可行方案，该模型亦可推广应用于不同水平和教学环境的汉语课堂。

关键词：多模态写作、初级汉语、句子写作评估、认知负荷、支架教学

1. INTRODUCTION

Many beginners find it hard to write full sentences in Chinese. Word order rules are strict and unfamiliar. For example, time and place often come before the verb, and structures like “把” or “是……的” have no clear English equivalent (Yip & Rimmington, 2004). Students may know the words, but still struggle to construct full sentences. Some omit key elements. Others produce one-word responses or avoid unfamiliar grammar patterns altogether (Po-Ching & Matthews, 2015). The fear of making mistakes is common. When writing tasks provide no support, students often hesitate—not due to a lack of knowledge, but due to uncertainty about how to start.

In classroom settings, it has been observed that visual prompts and sentence models help lower this barrier. When learners are given a picture and a sentence frame, they tend to write with more confidence. In one task, a student posted a GIF of hotpot along with the sentence “我想和朋友一起吃!” That week, participation increased, and all students submitted work. These small adjustments reduced writing anxiety and made the activity feel more manageable. In addition to sentence-level challenges, beginners may also struggle with stroke order, which can interrupt character writing. Karimah et al. (2023) observed frequent errors in writing common characters even after extended instruction. In addition to grammar and sentence construction, pronunciation and tone remain areas where many learners struggle, yet few sentence-level writing studies consider this dimension (Hao & Lü, 2023).

Digital platforms such as Padlet have also shown promise. Savaşçı & Akçor (2023) found that online writing tools encouraged student engagement. Jiang (2014) reported that structured digital tasks improved output quantity. Wiboolyasarin et al. (2024) and Shadiev & Yang (2020) explored AI-based feedback and noted improvements in grammar, although students still required sentence-level support. Despite these advances, many classrooms continue to use traditional writing prompts without scaffolding. These formats often fail to meet the needs of learners who are still working on basic sentence structure.

To address this issue, a set of writing tasks was developed incorporating visuals, sentence frames, and peer interaction. Students engaged with the tasks through emojis and short responses. The format reflected real classroom conditions and supported learner participation. Results indicated improvements in both sentence accuracy and writing confidence. This design draws on Mayer’s multimedia learning theory and Paivio’s dual coding model, which suggest that combining visual and verbal input can ease cognitive load.

This study investigates how multimodal writing tasks support sentence construction. It focuses on writing accuracy, learner confidence, and peer interaction in a beginner-level Chinese language course.

2. METHOD

2.1 Classroom Context

This study was conducted in a first-year beginner Chinese course at a university in Ireland. The course was offered as an elective through a Confucius Institute and included ten undergraduate students aged 18 to 22. Learners came from diverse cultural and linguistic backgrounds, and all had



completed approximately four months of formal Chinese instruction. Based on the ACTFL proficiency scale, most students were at the novice-mid to novice-high level.

The course aimed to help students describe everyday situations, write basic sentences, and use vocabulary in context. Each week, lessons included vocabulary review, grammar exercises, and short writing tasks. Digital tools were regularly integrated into classroom activities to support language input and encourage learner participation.

By the time of the study, students were comfortable with pinyin and high-frequency sentence structures but continued to struggle with writing full sentences independently. Teachers observed that many learners hesitated during writing tasks and often made word order mistakes when no support was provided. These observations guided the design of the multimodal writing tasks used in this study.

2.2 Task Design and Platform Integration

To reflect students' learning habits and reduce test anxiety, the writing tasks were designed using platforms and formats already familiar to them. Two main tools—Padlet and Quizlet—were selected based on their previous classroom use and accessibility.

Padlet was used as a collaborative space where students posted short sentences based on picture prompts. Posts were anonymous (e.g., Student A), and students could comment but not edit each other's work. The teacher exported the writing logs, including post count, comments, and emoji reactions, as both performance and interaction data. This setup allowed learners to express ideas with support and engage in peer response in real time.

Quizlet supported vocabulary review through matching tasks that included images and audio in "Live Mode." Students practiced word recognition and sentence building, while teachers could access accuracy reports and response times. Although not part of the formal assessment, Quizlet reinforced core vocabulary that later appeared in the writing tasks.

Both platforms were integrated into regular classwork throughout the semester. Students were already comfortable navigating them, which helped lower the cognitive load during assessment tasks. This familiarity also contributed to a more natural classroom-like environment, aligning with prior findings that digital familiarity can enhance learner confidence and reduce affective filters (Savaşçı & Akçor, 2023; Sun, 2019).

2.3 Task Structure and Theoretical Rationale

The design of the writing tasks was guided by cognitive load theory and dual coding theory. According to Sweller (1994), beginners benefit from reduced working memory demands during task performance. By providing sentence frames and visual prompts, the tasks helped focus attention on key grammatical forms. Paivio's (1986) dual coding theory also supports this approach, suggesting that verbal and visual input together enhances comprehension and recall. This task progression also reflects the expertise reversal principle, which suggests that instructional support must decrease as learners gain proficiency (Kalyuga, 2014).

These theories shaped the sequence of the tasks, moving from supported input to independent sentence production. The writing task design followed a three-phase structure to support beginner learners:



Input Stage: Learners were provided with visual prompts and sentence frames. These materials served to activate prior knowledge and reduce initial hesitation in sentence construction.

Support Stage: During task completion, students engaged in peer interactions using Padlet. They responded to others' posts with emojis or short comments. This layer of interaction offered real-time feedback and encouraged participation in a low-stress setting.

Output Stage: Final written sentences were collected and scored using a rubric. Performance was evaluated across three dimensions: language accuracy, content coherence, and interaction effort.

Table 1 summarizes the support and purpose of each phase in the three-stage task design. The three-stage design reflects a progression from supported input to independent output, aligned with cognitive load theory (Sweller, 1994) and dual coding theory (Paivio, 1986). The four writing tasks were also sequenced to gradually increase cognitive demand. For example, Task 1 focused on vocabulary matching and required minimal sentence generation, while Task 4 asked learners to reorder jumbled words into full sentences independently. This progressive design aimed to reduce processing stress in early tasks and build toward more autonomous performance.

Table 1.

Stage	Support Provided	Purpose
Input Stage	Visual prompts; Sentence frames	Activate prior knowledge and reduce anxiety
Support Stage	Padlet interaction; Emoji responses; Peer comments	Encourage engagement and reinforce learning through interaction
Output Stage	Written sentence production; Rubric-based assessment	Evaluate language accuracy, coherence, and participation

Three-Stage Multimodal Writing Task Design

2.4 Test Implementation

This study followed an explanatory sequential mixed methods design. Quantitative performance data were collected and analyzed first, followed by qualitative feedback from student interviews to help explain the patterns. This approach allowed for a more complete understanding of both outcomes and learner experience.

Each student completed four scaffolded writing tasks individually at the end of the semester. The tasks varied in visual support and sentence complexity, and were carried out in the following sequence:

Task 1: Vocabulary Matching

Task 2: Image-Supported Sentence Writing

Task 3: Gap-Fill Completion

Task 4: Sentence Reordering

In addition to the written scripts, interaction data from Padlet were collected. Three indicators were used to measure engagement: (1) number of posts, (2) number of comments, and (3) number of emoji reactions. These were combined into an interaction index, which informed the "Interaction Effort" component of the rubric. This allowed student performance to be assessed not only through writing products but also through participation in collaborative activities.



Each task began with a sample and brief instructions to ensure clarity. Although students used Padlet in class throughout the semester, the final tasks were completed on paper to control for testing conditions. The goal was to examine how structured input and multimodal support shaped students’ ability to construct Chinese sentences independently.

The four tasks were designed to gradually reduce external support and increase cognitive demand. Figure 1 summarizes the type of multimodal support available in each task, including visuals, sentence frames, and opportunities for interaction.

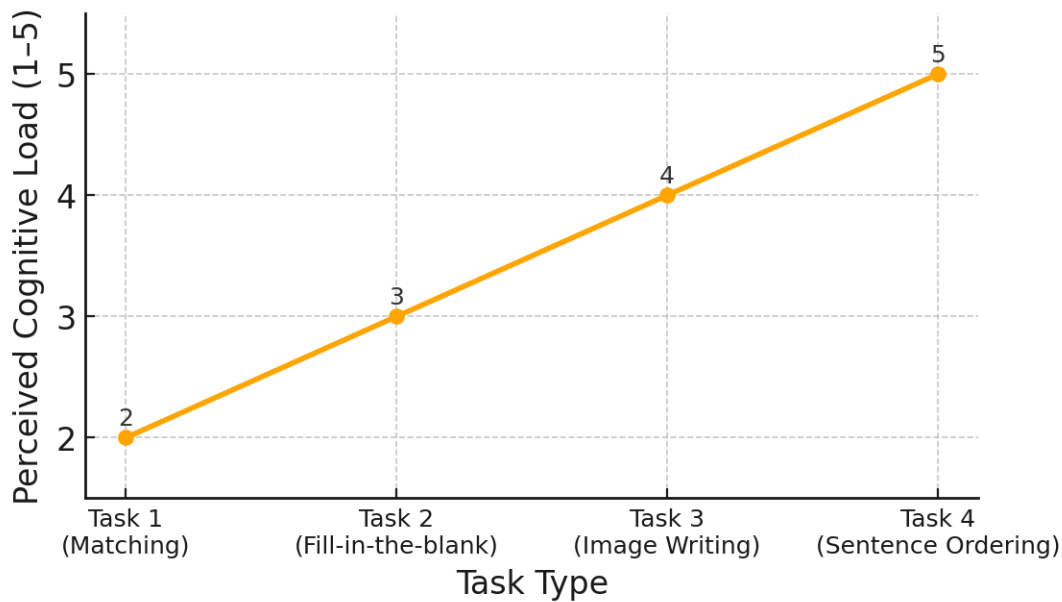


Figure 1. Multimodal support across writing tasks

To gain deeper insight, two students were interviewed after the tasks. They were asked about task difficulty, motivation, and their impressions of the multimodal format. Their comments helped interpret differences in task performance and engagement levels.

2.5 Rubric Scoring Details

A scoring rubric was developed to evaluate student performance across three dimensions: Language Accuracy, Content Coherence, and Interaction Effort (Hughes, 2003). Each dimension was rated on a 3-point scale (1 = limited, 2 = basic, 3 = competent). All student work was scored independently by two raters familiar with beginner Chinese instruction. Inter-rater agreement reached $\kappa = 0.82$, indicating high reliability.

Language Accuracy focused on correct word order, verb usage, and sentence-level grammar. Sentences had to follow basic structures such as Subject–Verb–Object or “Time–Place–Verb–Object” patterns.

Content Coherence assessed whether the sentences responded clearly to the given prompt. This included internal logic, contextual relevance, and whether the message made sense to a peer reader.

Interaction Effort was measured using students’ Padlet activity, including the number of posts, comments, and emoji reactions. These were combined into an “interaction index” to reflect peer engagement during writing.



The rubric was adapted from Luoma (2004), with adjustments to fit the sentence-level focus and digital context of this study. While most existing rubrics target paragraph or essay writing, this design aimed to capture early-stage learner output more appropriately. The rubric was piloted with sample responses before formal scoring and revised based on rater feedback. For practical classroom use, the rubric criteria were also translated into a simplified 10-point format. Table 2 outlines the classroom version used during scoring.

Table 2.

Dimension	Criterion Description	Score Basis (/10)
Interaction Engagement	At least 3 posts, 2 comments, and varied emoji use	Active peer participation
Content Coherence	Clear logic and story development	Relevant and organized ideas
Language Accuracy	No more than 2 grammar errors, correct vocab usage	Form accuracy and fluency

Simplified Classroom Scoring Sheet (Converted from Main Rubric)

2.6 Statistical Treatment

To better understand the effect of task design on learner performance, a paired-sample t-test was conducted comparing the scores from Task 2 (image-supported writing) and Task 4 (sentence reordering). Results showed a statistically significant difference in mean scores:

Task 2: M = 2.70, SD = 0.48

Task 4: M = 1.90, SD = 0.57

t(9) = 4.12, p < .01, Cohen’s d = 1.30

The effect size suggests a large impact (Cohen, 1988), indicating that the design of multimodal support had a meaningful influence on learner outcomes. While the sample was small (n = 10), these within-subject comparisons helped reduce individual variation and provided preliminary evidence for task impact. This statistical analysis was used to support the rubric-based scoring and interpret patterns observed across tasks (Green, 2020).

3. FINDINGS AND DISCUSSION

This section presents findings from both quantitative and qualitative data, organized around task performance, learner experience, and assessment implications. Each result is interpreted in relation to the multimodal support provided and the cognitive demands of the task.

3.1 Task Performance Across Modalities

Student performance varied across the four writing tasks. Tasks 2 and 3, which provided both visual prompts and sentence scaffolds, received the highest average scores in both Language Accuracy and Content Coherence. Most students were able to produce complete, meaningful sentences with few word order errors. By contrast, Task 4, the sentence reordering task, had the lowest scores. Several students misplaced time and location phrases, resulting in grammatically correct but awkward sentences.



This pattern suggests that scaffolded tasks with multimodal support helped students manage sentence construction more effectively. According to cognitive load theory (Sweller, 1994), tasks that reduce working memory demands allow learners to focus more on language output. When pictures and sentence frames were available, students used them to organize ideas and apply target grammar structures. Without these supports, as in Task 4, learners had to mentally reconstruct sentence logic, which increased the risk of mistakes.

These findings align with previous research on input design and scaffolded writing (Sun, 2019; Guo, 2023). They also support Paivio’s (1986) dual coding theory, where visual and verbal information processed in parallel can enhance memory and retrieval. In this case, visuals helped learners anchor meanings, while sentence frames supported accurate expression.

This trend is also reflected in the self-reported cognitive load ratings (see Figure 2), where Task 4 was consistently rated as more demanding than Tasks 2 and 3. Learners noted difficulty in reconstructing sentence order without visual or structural support.

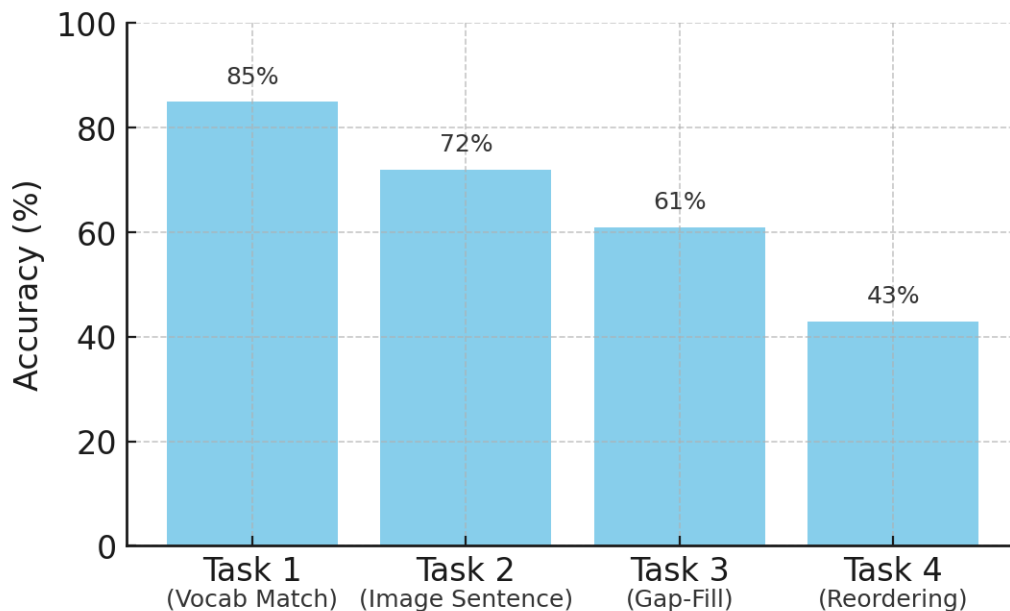


Figure 2. Cognitive load ratings by task complexity

3.2 Cognitive Load and Grammar Complexity

Interaction data from Padlet provided further insight into student engagement. Tasks 2 and 3 not only scored higher in writing quality but also generated more interaction. On average, each student made 2–3 original posts, commented on at least one peer’s work, and used emojis to respond. By contrast, in Task 4, most students completed only one post with minimal peer feedback. This pattern is reflected in the interaction index, where Tasks 2 and 3 showed consistently higher values.

These results suggest that tasks with clearer visuals and sentence scaffolds also encouraged more peer engagement. Students appeared more confident in sharing their responses when the task demands were manageable. The social element—being able to view and react to peers’ writing—seemed to reduce pressure and promote a sense of shared learning.



This observation echoes findings by Savaşçı & Akçor (2023), who noted that digital platforms can lower affective filters and create a more relaxed writing environment. Similarly, Jiang (2014) argue that interaction-centered tools like Padlet can support not only language output but also classroom belonging. In this study, participation was not forced, yet most students chose to respond to others when support was available.

3.3 Learner Perceptions and Affective Engagement

To better understand the patterns observed in task performance, two students were interviewed after the writing sessions. Both had completed all four tasks and participated actively in Padlet discussions. Their reflections offered insight into how support levels and task formats shaped their experience.

One student shared that Tasks 2 and 3 felt “easier to start” because they “could see the picture and guess the structure.” She added, “I didn’t worry much about grammar because the pattern was already there—I just followed it.” The presence of visuals and sentence models reduced hesitation and provided a clear entry point for writing.

The second student emphasized the social aspect of Padlet: “When I saw someone write something funny, I wanted to reply. That made writing feel like a game, not a test.” He also noted that the emoji reactions helped build confidence: “When I got a thumbs-up, I thought maybe my sentence wasn’t too bad.” These comments reflect how interactive design can support emotional comfort and motivation.

Interview data were transcribed and coded using a simple thematic analysis. Key themes were labeled as (1) task clarity, (2) confidence, and (3) peer influence. Two researchers independently coded the transcripts and discussed any disagreements. The inter-coder agreement was high, and final themes were used to explain differences in writing behavior across tasks.

These reflections help explain why scaffolded tasks resulted in more accurate writing and greater participation. They also show how social and emotional factors—often overlooked in assessment—shape early-stage writing experiences.

Students' comments were grouped into recurring themes using Braun and Clarke’s (2006) coding method. Table 3 shows the key themes and example quotes from the interviews.

Table 3.

Theme	Definition	Sample Quote
Visual Prompt Aid	Use of images to support word recall	“The pictures helped me remember the word faster.”
Task Familiarity	Comfort from task types used in class	“This was just like something we did on Padlet.”
Cognitive Overload	Student stress from multi-step instructions	“Too many things at once—I forgot what to do.”

Themes from Student Reflections on Multimodal Tasks

These codes were independently reviewed by two researchers and cross-checked for consistency. The final categories reflect both emotional and cognitive aspects of learner experience.

3.4 Using Process Data for Assessment



Taken together, the four tasks differed not only in performance outcomes but also in the types of support they provided. Tasks with stronger input cues—such as visuals and structured formats—tended to yield higher accuracy and learner confidence. In contrast, open-ended tasks that required sentence generation without scaffolding led to greater cognitive difficulty, especially when familiar patterns were absent.

The data suggest a three-layer chain linking multimodal input, cognitive load, and learning outcomes. Guided by Mayer’s multimedia learning model (2020), Paivio’s dual-coding theory (1986), and Fredricks et al.’s engagement framework (2004), the findings are interpreted across three interconnected levels:

Input Support: Visuals, familiar tools (e.g., Padlet, Quizlet), and structured tasks provide external cues that reduce anxiety and aid memory recall.

→ Best reflected in the image-based and matching tasks.

Cognitive Mediation: Tasks that guide attention and limit working memory demands are more accessible to novice learners.

→ Gap-fill tasks worked better than sentence reordering due to lower intrinsic load.

Affective and Motivational Engagement: Learners respond more positively to tasks that feel familiar and interactive. Emotional comfort increases participation and willingness to write.

→ Padlet-based tasks showed higher learner confidence and interaction.

Each task’s performance profile corresponded to its position across these three dimensions. Sentence reordering did not fail solely due to grammar complexity—it lacked all three layers of support.

To evaluate both written output and learner participation, a rubric was developed with three weighted components: interaction effort (20%), content coherence (40%), and language accuracy (40%). See Table 4 for the detailed criteria.

Table 4.

Dimension	Description	Weight
Interaction Engagement	Number and variety of posts/comments	20%
Content Coherence	Logical story progression	40%
Language Accuracy	Grammar and vocabulary correctness	40%

Collaborative Writing Task Scoring Criteria

Pedagogical Implications and Suggestions

This study highlights several practical strategies for designing writing tasks in beginner Chinese classrooms. The findings suggest that small shifts in task format—such as adding visuals or sentence frames—can significantly improve student confidence, accuracy, and engagement. Below are three key suggestions for classroom application.

(1) Align writing tasks with available input supports.



Tasks that combine visuals and structured prompts provide essential cues for novice learners. When students can see and interpret meaning from images or sentence templates, they are more willing to write and less likely to freeze due to grammar uncertainty. Teachers can build task sequences that gradually reduce scaffolds as learners gain confidence, following the “perceptual support → cognitive control” model proposed by Mayer (2020).

(2) Include interaction data as part of writing assessment.

Incorporating basic process data—such as post count, comments, and reactions—offers a broader view of learner effort. While output quality matters, how learners engage with the task and with peers also reflects their development. Including a weighted “interaction effort” score encourages active participation and helps recognize learners who may be less accurate but highly engaged.

(3) Use familiar digital tools to create a low-stress writing environment.

When students work within platforms they already use (like Padlet or Quizlet), the writing task feels more approachable. This comfort lowers affective barriers and increases motivation (Fredricks et al., 2004). Rather than replacing paper-based tests entirely, digital spaces can complement formal assessments and help prepare students for independent writing.

These suggestions are easy to adapt in different classroom settings, even those with limited technological resources. The core idea is to treat writing as a process that unfolds with support, not a one-time performance. By building in multimodal input and small peer interactions, teachers can help beginner learners write with more accuracy, confidence, and enjoyment.

4. CONCLUSION

This study examined how multimodal tasks can support sentence-level writing in beginner Chinese classrooms. By comparing four tasks with varying levels of visual and structural support, the findings showed that scaffolded input improves accuracy, lowers cognitive load, and encourages peer interaction. A three-phase framework—input support, cognitive mediation, and engagement—was used to interpret these results and guide classroom application.

A simple rubric was also developed to assess not only written accuracy but also interaction effort. This approach highlights the value of using process data in evaluating learner participation and provides a practical model for low-stakes writing assessment.

Several limitations should be noted. The sample size was small ($n = 10$) and limited to students enrolled in one elective course. Most participants had similar learning backgrounds and access to digital tools like Padlet. As a result, the findings may not fully apply to younger learners, exam-oriented settings, or resource-limited classrooms. In addition, the writing tasks were tested at a single time point, which limits conclusions about long-term improvement.

Despite these limitations, the task design model has potential for wider use. The three-phase structure can be adapted to different levels by adjusting the amount and type of support provided. In classrooms without digital platforms, visual prompts and printed sentence frames can still offer similar scaffolding effects.

Future studies could extend this work in several directions. One possibility is to track how learners perform across multiple writing cycles to measure sustained development. Another is to compare the effects of human feedback and AI-based correction tools on sentence accuracy and



learner confidence. Further research could also examine how multimodal scaffolds affect different learner groups, including heritage speakers and younger students.

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