



วารสารนวัตกรรมและวิทยาการเรียนรู้  
<https://www.tci-thaijo.org/index.php/edgkkuj>  
ดำเนินการวารสารโดย คณะศึกษาศาสตร์ มหาวิทยาลัยขอนแก่น

## การพัฒนาความสามารถในการเขียนภาษาอังกฤษของนักเรียนชั้นประถมศึกษาปีที่ 4 ด้วยรูปแบบการเรียนรู้แบบปรับเหมาะตามบริบท ร่วมกับแนวการสอนเขียนแบบเน้นกระบวนการ

### Enhancing English Writing Ability in Grade 4 Students Using a Context-Adaptive Learning Model with a Process-Based Approach

รักขวัญ พลจารย์<sup>1</sup>, ปิยดา สุดาธิพย์<sup>2</sup>, และ ขวัญฤดี ศรีบุรินทร์<sup>3\*</sup>

Rakkwan Pholjarn, Piyada Sudathip<sup>2</sup> & Miss Kwanruedee Sriburin<sup>\*</sup>

คณะศึกษาศาสตร์ มหาวิทยาลัยขอนแก่น<sup>1</sup>, คณะศึกษาศาสตร์ มหาวิทยาลัยขอนแก่น<sup>2</sup>, และ โรงเรียนอนุบาล สุรัสวดี ขอนแก่น<sup>3\*</sup>

Faculty of Education, Khon Kaen University, Thailand, Faculty of Education, Khon Kaen University, Thailand, Suratsawadee Khon Kaen School, Thailand

Received: December 9, 2025 Revised: June 4, 2026 Accepted: June 5, 2026

#### Abstract

Writing is among the most challenging skills for young learners of English as a Foreign Language (EFL), particularly in Thai primary classrooms where writing instruction often focuses on rote copying rather than meaningful text production. This study aimed to enhance Grade 4 students' English writing ability by integrating a Context-Adaptive Learning Model (CALM) with a Process-Based Approach (PBA). Sixteen students participated in four CALM-PBA instructional cycles over eight hours using an action research design with pre- and post-testing. Quantitative results revealed substantial improvement in students' writing performance: the mean post-test score ( $M = 87.32\%$ ) was significantly higher than the pre-test ( $M = 38.92\%$ ),  $t(15) = 18.45$ ,  $p < .001$ , with a very large effect size ( $d = 4.05$ ). Qualitative analysis of students' drafts showed clear progress in idea organization, vocabulary range, sentence variety, and grammatical accuracy. Learners' writing developed from short, fragmented sentences to coherent, well-structured paragraphs demonstrating greater fluency and syntactic control. In addition, the engagement questionnaire indicated a high overall level of student engagement ( $M = 4.13 / 5$ ), reflecting positive attitudes toward contextualized, scaffolded, and collaborative writing lessons. These findings confirm that integrating CALM, emphasizing diagnostic assessment, contextual relevance, and adaptive support, with the recursive stages of PBA provides a structured yet flexible framework for enhancing writing ability, fostering motivation, and supporting meaningful literacy development among young EFL learners.

**Keywords:** English writing ability, Context-Adaptive Learning Model, Process-Based Approach

\*Piyada Sudathip. Tel.: 062 964 5461

Email address: piyadasu@kku.ac.th

## ■ Introduction

Writing proficiency is a fundamental pillar of literacy development and a critical gateway to content learning across all academic disciplines. For young learners of English as a Foreign Language (EFL), writing is not merely a mechanical task of transcription but a complex cognitive activity requiring the simultaneous coordination of linguistic knowledge, rhetorical planning, and self-regulatory mechanisms. Despite its importance, writing remains the most challenging skill for primary school students in non-native contexts (Hyland, 2019). In the Thai primary education landscape, this challenge is exacerbated by traditional instructional paradigms. Many classrooms still rely heavily on teacher-centered methods, where writing activities are frequently restricted to rote copying, filling in blanks, or translating isolated phrases (Sermsook, Limruangrong, & Rungruang, 2017). Such "product-oriented" approaches prioritize grammatical accuracy over the communicative purpose of writing, leaving learners ill-equipped to generate original ideas, organize coherent content, or engage in meaningful revision.

The urgency for pedagogical reform is reflected in the current study's baseline data. Grade 4 students involved in this research initially attained an average pre-test score of only 38.92%. This low performance signifies a significant "learning gap" in basic writing components, including idea development, sentence structure, and appropriate vocabulary use. This deficiency is not merely a localized issue but a reflection of a broader systemic need for active learning strategies that can bridge the gap between theoretical language knowledge and practical application (Thongthee, 2020).

At the national policy level, the Office of the Basic Education Commission (OBEC) has increasingly emphasized learner-centered reforms and active learning approaches. Recent scholarly discourse in Thailand has highlighted the necessity of "Contextualized Teaching", instruction that draws upon the students' immediate environment and cultural background to make learning more relevant (Intasena, Srimunta, & Yotha, 2025). Furthermore, instructional models that integrate structured learning stages with high levels of learner participation have shown promising results in improving literacy outcomes (Kwangmuang, 2021). However, as Pinweha (2025) suggests, effective innovation in the Thai classroom requires more than just a rigid structure; it demands "responsive adaptation", the ability of the teacher to modify instruction in real-time based on the diverse and fluctuating needs of the learners.

To address these multi-faceted challenges, this study proposes a synergistic integration of two robust frameworks: the Process-Based Approach (PBA) and the Context-Adaptive Learning Model (CALM). The PBA, pioneered by Flower and Hayes (1981), revolutionized writing instruction by conceptualizing it as a recursive cognitive process rather than a linear path toward a final product. By guiding students through stages of planning, drafting, revising, and editing, PBA demystifies the act of writing, transforming it into a series of manageable, low-stakes cognitive tasks. This is particularly beneficial for young EFL learners, as it reduces cognitive load and writing anxiety by allowing them to focus on meaning before mechanics (Zamel, 1982). Complementing this process-oriented structure is the Context-Adaptive Learning Model (CALM). Developed by Sudathip, Yuankrathok, and Chuanon (2026), CALM is rooted in the principles of adaptive teaching and diagnostic assessment. It emphasizes that for learning to be effective, the instructional methodology must be fluid, responding to the "context" which includes students' readiness levels, local

cultural relevance, and immediate learning difficulties. CALM provides a 6-stage framework (Context Analysis, Planning, Implementing, Monitoring, Feedback, and Improvement) that empowers teachers to provide "scaffolding" that is precisely tuned to the student's Zone of Proximal Development (Vygotsky, 1978).

The integration of PBA and CALM represents a novel pedagogical intervention. While PBA provides the systematic "backbone" of the writing journey, CALM ensures that this journey is tailored to the lived reality of the Grade 4 classroom. By combining structure with flexibility, this study seeks to evaluate how this integrated model can enhance not only the linguistic output of Thai EFL students but also their confidence and engagement in the writing process.

## ■ Research Objectives

The study was guided by the following objectives:

- 1) To examine the improvement in students' English writing ability after learning through the CALM–PBA instructional approach.
- 2) To analyze qualitative changes in students' written work across the CALM–PBA instructional cycles.
- 3) To investigate students' engagement and perceptions toward the CALM–PBA writing lessons.

## ■ Literature Review

### *1. The Process-Based Approach to Writing (PBA)*

Traditionally, writing instruction in EFL contexts was dominated by the "Product-Based Approach," which focused primarily on the final written output and linguistic accuracy. However, the Process-Based Approach (PBA) shifted this paradigm by viewing writing as a goal-directed, recursive cognitive process (Flower & Hayes, 1981). According to this framework, writing is not a linear path but a series of overlapping and interrelated stages where the writer constantly moves back and forth between planning, translating thoughts into text, and reviewing.

For young EFL learners, particularly at the primary level, the PBA is highly beneficial as it treats writing as "meaning-making" rather than a mere grammar exercise (Zamel, 1982). Hyland (2003) emphasizes that when students are guided through the process, their "writing anxiety" is significantly reduced because they are not expected to produce a perfect text on the first attempt. The core components of PBA in this study are detailed as follows:

- (1) Pre-writing/Planning: This stage involves brainstorming and organizing ideas. For Grade 4 students, this is often supported by visual aids or graphic organizers to stimulate vocabulary retrieval.
- (2) Drafting: Learners focus on getting their ideas down on paper. In this stage, fluency is prioritized over grammatical precision, allowing students to develop their "voice" in English.
- (3) Revising and Editing: These stages involve refining the content for clarity and eventually correcting mechanical errors. Feedback, both from teachers and peers, is the engine that drives this stage, transforming the writing into a social and collaborative activity (Arici & Kaldırım, 2021).

Empirical evidence suggests that PBA fosters not only better writing quality but also a positive attitude toward English. In the Thai context, Tangkiengsirisin (2019) found that university students improved significantly when the focus shifted to the process; similarly, Kongsom (2021) noted that for younger learners, the integration of structured feedback during the drafting stage is crucial for developing cohesive and coherent paragraphs.

## 2. The Context-Adaptive Learning Model (CALM)

While PBA provides the "what" of writing instruction, the Context-Adaptive Learning Model (CALM) provides the "how" in terms of classroom management and teacher responsiveness. Formulated by Sudathip, Yuankrathok, and Chuanon (2026), CALM is rooted in the principle that no single instructional method fits all classrooms. Instead, teachers must be "adaptive" (Fairman et al., 2020), meaning they must continuously diagnose student needs and adjust their instruction accordingly.

CALM operates through a systematic six-step cycle designed to ensure that the instruction remains relevant to the learners' local context and current ability levels:

(1) Context Analysis: The teacher identifies the linguistic background of students (e.g., L1 interference) and their interests (e.g., local community topics) to make the writing prompts meaningful.

(2) Planning Adaptive Lessons: Lessons are designed with built-in flexibility. For example, if students struggle with "action verbs," the teacher plans additional visual scaffolding.

(3) Implementing Strategies: The teacher uses active learning techniques, ensuring that students are not passive recipients but active participants in the writing task.

(4) Monitoring & Assessment: This is a "real-time" diagnostic phase. As students write, the teacher moves around the room to identify common errors or "bottlenecks" in the writing process.

(5) Feedback & Reflection: Students reflect on what they found difficult, and the teacher provides constructive "just-in-time" feedback.

(6) Improvement & Innovation: Based on reflections, the teacher modifies the tools or strategies for the next cycle to ensure continuous growth.

This model aligns with the calls for "Contextualized Teaching" in Thailand (Intasena et al., 2025), where the goal is to bridge the gap between classroom English and the students' lived experiences.

Table 1

Table 1. Comparison between Traditional Product-Based Instruction and the Integrated CALM-PBA Model

| Feature        | Traditional Product-Based Instruction            | Integrated CALM-PBA Model                                  |
|----------------|--------------------------------------------------|------------------------------------------------------------|
| Primary Focus  | Final product (accuracy, grammar, spelling).     | Writing process (idea generation, drafting, revision).     |
| Teacher's Role | Evaluator and corrector of errors.               | Facilitator, monitor, and adaptive scaffold-provider.      |
| Student's Role | Passive; follows rigid templates or copies text. | Active; generates original ideas and reflects on learning. |

| Feature            | Traditional Product-Based Instruction         | Integrated CALM-PBA Model                                   |
|--------------------|-----------------------------------------------|-------------------------------------------------------------|
| Feedback           | Summative; given only at the end of the task. | Formative; continuous throughout the 6-step CALM cycle.     |
| Context            | Generic or textbook-based topics.             | Contextualized; adapted to students' lives and community.   |
| Instructional Pace | Fixed; follows a predetermined schedule.      | Adaptive; adjusted in real-time based on learner readiness. |

### 3. Theoretical Synergy: Adaptive Scaffolding and ZPD

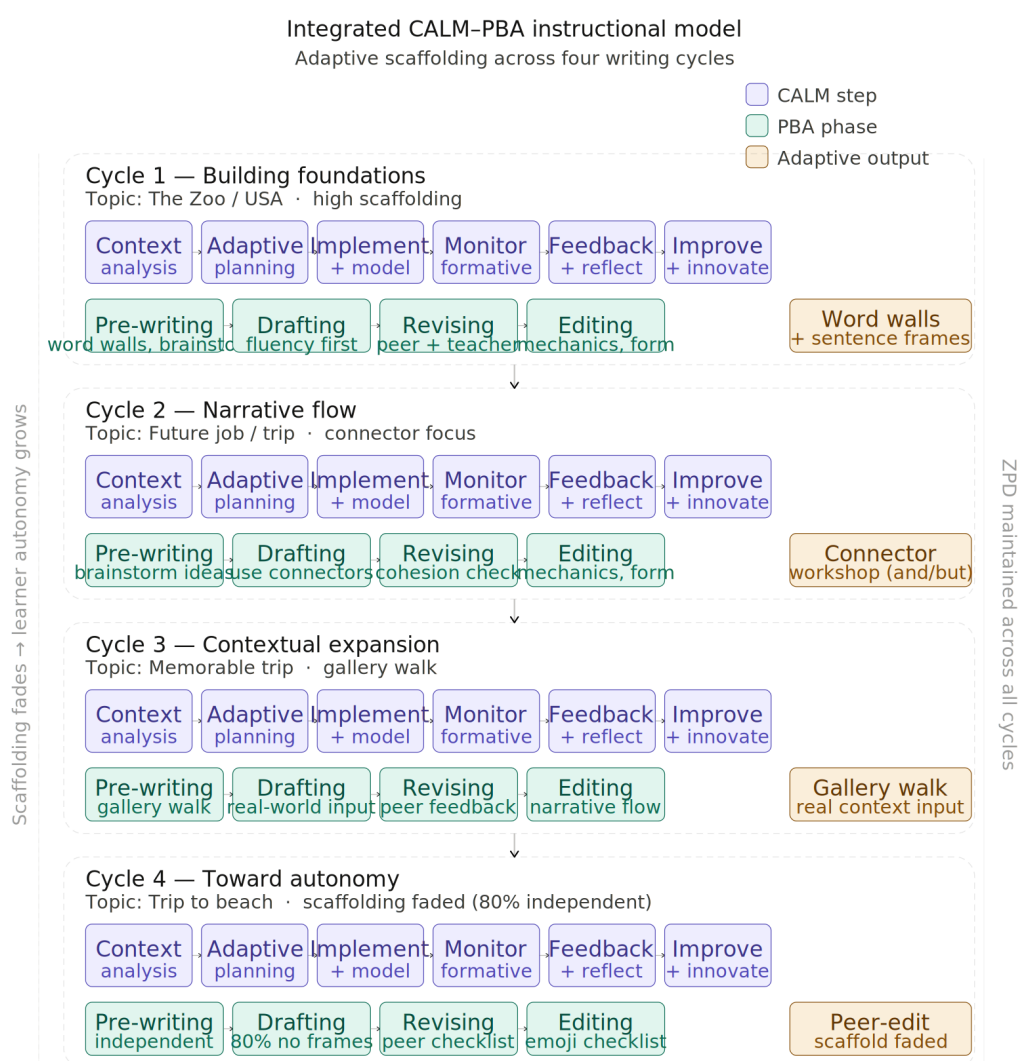


Figure 1. The Integrated CALM-PBA Instructional Model:  
Six-Step Adaptive Cycle Across Four Writing Phases

The integration of CALM and PBA is theoretically grounded in Sociocultural Theory, specifically Vygotsky's (1978) Zone of Proximal Development (ZPD). The synergy occurs when the recursive stages of PBA are "scaffolded" through the adaptive mechanisms of CALM.

Scaffolding, as defined by Wood, Bruner, and Ross (1976), involves providing temporary support that allows a learner to perform a task they could not yet do independently. In this study, CALM ensures that the scaffolding is not static. In early cycles (Cycle 1 & 2), the teacher might provide heavy scaffolding, such as sentence frames and "word banks." As students progress and demonstrate increased proficiency, the teacher, through the "Monitoring" and "Feedback" steps of CALM, systematically fades this support, leading to learner autonomy (Pinweha, 2025). This integration ensures that the writing process remains challenging yet achievable, preventing frustration and fostering sustained linguistic development.

## ■ Methodology

### *Research Design*

This study employed a Classroom Action Research (CAR) design, which is characterized by a cyclical process of planning, acting, observing, and reflecting (Kemmis & McTaggart, 1988). This design was chosen because it allows for the "adaptive" nature of the CALM model to be fully realized in a real-world EFL classroom. The research was divided into two phases: (1) The Developmental Phase, involving literature review and expert validation of the CALM-PBA model, and (2) The Action Research Phase, consisting of four instructional cycles (8 hours in total) aimed at enhancing students' writing ability.

### *Participants*

The participants were 16 Grade 4 students at a primary school in Khon Kaen, Thailand, selected through purposive sampling. These students were chosen because they shared similar English proficiency levels, categorized as "Beginner" based on initial assessments. Crucially, they had limited prior exposure to structured writing instruction beyond sentence-level copying. Ethical considerations were maintained, with informed consent obtained from school administrators and parents.

### *Research Instruments*

To ensure the rigor of the findings, four validated instruments were utilized:

- (1) CALM-PBA Lesson Plans: A series of four lesson plans (2 hours each) integrating PBA stages within the CALM management cycle. These plans focused on familiar topics (e.g., "My Family," "My Pets") to ensure contextual relevance.
- (2) English Writing Ability Test: A pre-test and post-test requiring students to write a short

paragraph (5-8 sentences). The test was validated for content validity.

(3) Context-Adaptive Writing Rubric: A 20-point holistic rubric assessing five domains: Content/Ideas, Organization, Vocabulary, Sentence Structure, and Mechanics. This rubric allowed for "adaptive grading" where progress in meaning-making was celebrated alongside linguistic accuracy.

(4) Learning Engagement Questionnaire: A 5-point Likert scale measuring behavioral, emotional, and cognitive engagement.

### *Research Procedures*

**The 4-Cycle CALM–PBA Intervention** The intervention was implemented over four cycles, with each cycle representing a 2-hour lesson. The unique "Adaptive" component of CALM was operationalized as follows:

Cycle 1: Building Foundations (Topic: Trip 1 - The Zoo/USA)

- *Observation:* During the 'Context Analysis' phase, the teacher found that students lacked the vocabulary for basic adjectives.

- *Adaptive Action:* The teacher adjusted the 'Planning' stage by introducing "Word Walls" and visual flashcards. The 'Scaffolding' was high, using sentence frames like "I am [adjective]."

Cycle 2: Narrative Flow (Topic: Trip 2 - Future Job/Trip)

- *Observation:* Students could write sentences but struggled with 'Cohesion' (linking sentences).

- *Adaptive Action:* Based on 'Monitoring,' the teacher introduced a simple "And/But" connector workshop during the 'Implementing' stage. PBA drafting focused on using at least two connectors.

Cycle 3: Contextual Expansion (Topic: Career 1 - Memorable Trip)

- *Observation:* Students felt disconnected from textbook topics.

- *Adaptive Action:* The teacher 'Adapted' the content by taking students on a "Gallery Walk" around the school to gather real-world inspiration. This moved the 'Planning' stage of PBA from the classroom to a physical context.

Cycle 4: Moving Toward Autonomy (Topic: Career 2 - Memorable Trip to Beach)

- *Observation:* Reflection from Cycle 3 showed students were becoming more confident in drafting but still ignored 'Editing.'

- *Adaptive Action:* The teacher implemented a "Peer-Editing Checklist" using simple emojis. Scaffolding was "faded" (reduced), requiring students to generate 80% of the content without sentence frames.

### *Data Collection Procedures*

The intervention was implemented across four instructional cycles, each lasting two instructional hours, for a total of eight hours. Each cycle adhered to the six-step Context-Adaptive Learning Model (CALM) integrated with the Process-Based Approach (PBA) structure.

The six CALM-PBA stages were operationalized as follows (Sudathip, Yuankrathok, & Chuanon, 2026; Intasena, Srimunta, & Yotha, 2025):

(1) Context Analysis: The teacher analyzed students' background knowledge, readiness, and learning needs using diagnostic questioning and review activities.

(2) Adaptive Lesson Planning: Lessons were designed based on diagnostic data, incorporating learner-centred tasks and locally relevant topics to enhance engagement.

(3) Implementation: Instruction began with activation of prior knowledge, explicit modelling of writing processes, and guided practice using graphic organizers.

(4) Monitoring and Formative Assessment: Students' performance during drafting and revising was observed, and feedback was provided continuously to identify emerging needs.

(5) Feedback and Reflection: Peer and teacher feedback were used to guide redrafting, while students engaged in reflective discussions about their progress and challenges.

(6) Improvement and Innovation: Instructional adjustments and materials were refined after each cycle to ensure alignment with learner progress and classroom context.

Across these stages, the PBA component structured learning into three core writing phases, planning, drafting, and revising, while CALM ensured adaptive differentiation at each phase. A pre-test of writing ability was administered before the first cycle and a post-test after the fourth cycle. Writing samples were collected at each stage to monitor progress, and students completed an engagement questionnaire at the end of the intervention to capture attitudinal responses toward the CALM-PBA model.

### *Data Analysis*

Data analysis employed both quantitative and qualitative approaches.

#### *Quantitative Analysis*

$E_1/E_2$  Efficiency:

$E_1$  represented the mean percentage of students' performance on in-class writing tasks.

$E_2$  represented the mean percentage on the post-test. The model's efficiency criterion was set at 80/80, following standard evaluation procedures in educational research (Silpcharu, 2020). Effectiveness Index (EI):

The EI indicated the normalized learning gain between pre-test and post-test scores.

Paired-Samples *t*-Test: Pre-test and post-test means were compared using a paired-samples *t*-test at the .05 significance level to determine statistical significance of improvement.

Effect Size (Cohen's  $d$ ): Cohen's  $d$  was calculated to evaluate the magnitude of difference between pre- and post-test scores, with benchmarks of 0.2 (small), 0.5 (medium), and 0.8 (large).

#### Engagement Questionnaire:

Descriptive statistics (mean and standard deviation) were computed for all items to determine students' engagement levels during the intervention.

#### Qualitative Analysis

Writing samples were examined across all four cycles to trace development in idea generation, organization, vocabulary, and grammatical accuracy. Emerging themes from drafts were coded and triangulated with quantitative findings to ensure validity. Improvement patterns, such as expansion of text length, clearer sequencing, and reduced language errors, were documented to illustrate learning growth consistent with CALM-PBA principles (Hyland, 2019; Tangkiengsirisin, 2019).

## ■ Research Results and Discussions

### *Research Results*

#### 1. Improvement in Students' English Writing Ability

The pre-test and post-test results indicated substantial improvement in students' English writing ability after participating in the CALM-PBA instructional cycles. As presented in Table 2, the mean writing score increased from 38.92% on the pre-test to 87.32% on the post-test, showing a gain of 48.40 percentage points. The difference was statistically significant,  $t(15) = 18.45$ ,  $p < .001$ , with a very large effect size ( $d = 4.05$ ).

These findings demonstrate that the integration of the Context-Adaptive Learning Model (CALM) and the Process-Based Approach (PBA) effectively enhanced learners' writing proficiency. The structured stages of the PBA, planning, drafting, revising, and editing, helped students manage the writing process more systematically, while the adaptive principles of CALM enabled instructional adjustments to match individual needs and readiness levels.

Through diagnostic observation and continuous feedback, students became more confident in generating ideas and expressing them in English. This quantitative improvement aligns with previous research suggesting that process-based instruction, when coupled with contextual and adaptive teaching, leads to higher achievement and retention in writing skills (Hyland, 2003; Kongsom, 2021; Tangkiengsirisin, 2019).

Therefore, the findings confirm that the CALM-PBA integration can significantly support young EFL learners' writing development by balancing structure and flexibility within the learning process.

Table 2

Table 2. Comparison of Pre-test and Post-test Writing Scores ( $n = 16$ )

| Test      | Mean (%) | SD  | $t(15)$ | $p$    | Effect Size ( $d$ ) |
|-----------|----------|-----|---------|--------|---------------------|
| Pre-test  | 38.92    | 2.1 | 18.45   | < .001 | 4.05                |
| Post-test | 87.32    | 4.1 | —       | —      | —                   |

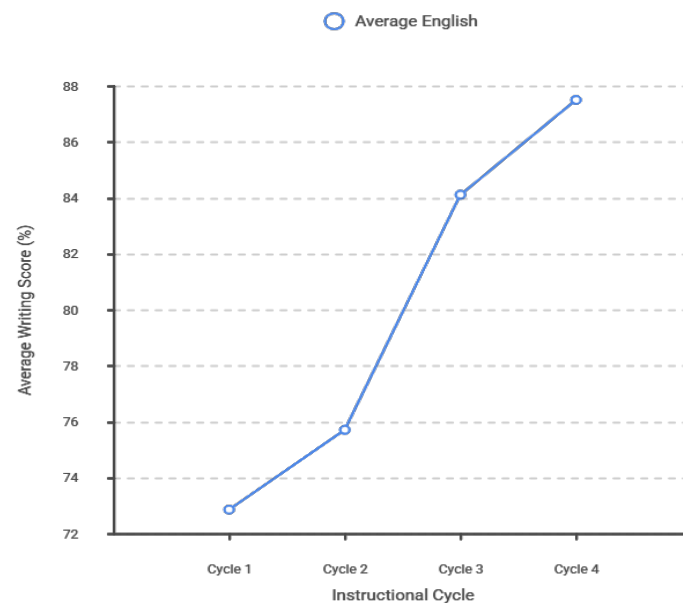


Figure 2: Average English Writing Performance Across Four CALM-PBA Instructional Cycles (N=16)

## 2. Qualitative Development in Students' Writing Performance

A longitudinal analysis of students' written artifacts across the four instructional cycles reveals a distinct developmental trajectory. The progression from fragmented lexical units to cohesive paragraph construction demonstrates the effectiveness of the integrated CALM-PBA model.

### Cycle 1: The Emergence of Content Intent (Topic: Trip 1 - The Zoo/USA)

In the initial cycle, students began to move away from isolated word copying toward expressing personal intent, though syntactic structures remained simple and influenced by L1 (Thai) patterns. For instance, Student 1 wrote: "I want to go to the zoo and I want to eat a KFC," while Student 2 expressed a broader ambition: "I want to go a city in usa and play in isa 3 day." Although spelling errors (e.g., "isa" for USA) and grammatical inconsistencies were present, these drafts represent the "Planning" stage of the PBA, where students began to prioritize meaning making over rote transcription.

### Cycle 2: Structural Awareness (Topic: Trip 2 - Future Job/Trip)

As the teacher applied the "Monitoring & Assessment" phase of CALM, students were introduced to basic sequential markers. Student 1's draft on a future career showed the initial use of transition signals: *"my favourite job: doctor. First, I will go to the hospital. Next, I will..."* This indicates an emerging awareness of textual organization, a core component of the writing rubric, even if the narratives were not yet fully concluded.

#### Cycle 3: Cohesion and Affective Expression (Topic: Career 1 - Memorable Trip)

In Cycle 3, the "lexical explosion" became evident as students started to produce more extended and cohesive texts. Student 1 demonstrated a clear grasp of the Process-Based phases, connecting daily activities with a specific emotional outcome: *"First I wake up and take a bath. Next I go to hotel and i go to shop and by a teddy bear. Finally I am go to sleep. I am so happy!"* This draft shows a successful integration of the "Finalizing" stage, where students could conclude their narrative with a personal reflection.

#### Cycle 4: Syntactic Complexity and Contextual Relevance (Topic: Career 2 - Memorable Trip to Beach)

By the final cycle, students moved toward more complex past-tense narratives, demonstrating the "Improvement & Innovation" of the model. Student 2's writing about a beach trip reflected a sophisticated use of multiple connectors: *"First I went to beach... Next I went to played ball. Then we went to ate banana finally we went back to home."* Despite the persistent use of double marking in past tense (e.g., "went to played"), the student's ability to sequence five distinct actions indicates a high level of metacognitive control over the writing process.

This qualitative evolution confirms the efficacy of Adaptive Scaffolding. By maintaining students within their Zone of Proximal Development (ZPD) through the four cycles, the CALM-PBA model enabled learners to transition from simple "Subject-Verb" intent to structured, cohesive, and meaningful English paragraphs.

#### Students' Engagement and Perceptions toward CALM-PBA Lessons

The analysis of student engagement data indicated that learners were highly motivated and positively disposed toward the CALM-PBA lessons. The overall mean score was 4.13, with a standard deviation of 0.48, on a five-point rating scale. This high level of engagement was intrinsically linked to the operationalization of the six-step CALM cycle, which emphasized learner-centeredness and adaptive responsiveness throughout the instructional process.

To complement this quantitative indicator, qualitative evidence drawn from student verbal responses and the teacher's reflective field notes provides a richer picture of the classroom atmosphere across the four cycles. In post-lesson discussions during Cycle 2, several students spontaneously expressed their enjoyment of the connector workshop, with one student noting, "I like using 'but' because my sentence looks longer and better." By Cycle 3, the teacher's field notes recorded a noticeable shift in classroom dynamics: students were observed initiating peer discussion during the drafting phase without teacher prompting, and the volume of on-task talk increased visibly compared to Cycle 1. The teacher noted, "Students no longer waited for me to tell them what to write—they were negotiating ideas with

their classmates.” During Cycle 4, open-ended responses on the questionnaire further revealed that learners valued the sense of safety afforded by the peer-editing checklist; one student wrote, “I am not scared to show my paper because my friend helps me, not laugh at me.” These qualitative observations triangulate the quantitative engagement score and illustrate that the CALM-PBA environment fostered not only behavioral participation but also the emotional safety and collaborative spirit necessary for sustained literacy development.

#### Impact of Contextual Relevance and Adaptive Planning

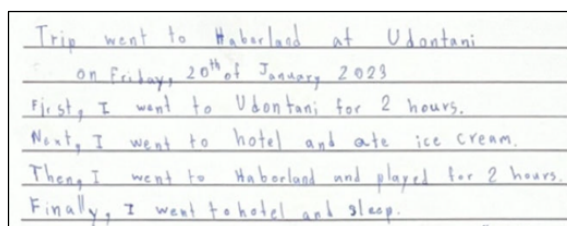
The strong engagement score was primarily attributed to the Context Analysis and Adaptive Lesson Planning stages. By identifying students’ interests and background knowledge, such as dream careers and personal trips, the teacher was able to design learning tasks that resonated with the learners’ lived experiences. Open-ended responses from the questionnaire revealed that students enjoyed lessons connected to familiar real-life topics, including aspirations such as becoming a “YouTuber” or a “Doctor.” This contextual relevance successfully lowered the students’ affective filter, as evidenced by the uninhibited expression of intent in Cycle 1, for example, *“I want to go to the zoo and I want to eat a KFC,”* and the clear affective joy expressed in Cycle 3, such as *“I am so happy!”*

#### Scaffolding and Structural Security

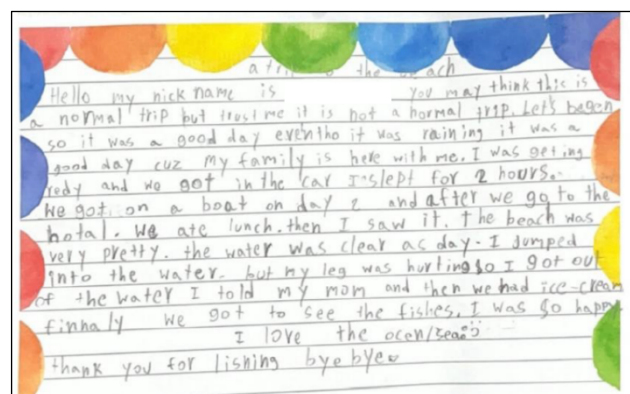
Students also valued the Implementation and Monitoring stages, during which graphic organizers and explicit teacher modeling provided a clear procedural roadmap for writing. Questionnaire data indicated that learners felt more secure when they were guided through the step-by-step phases of the Process-Based Approach. As students progressed from Cycle 1 to Cycle 4, their written artifacts demonstrated a noticeable transition from writing anxiety to greater metacognitive control. For instance, the use of sequential markers such as “First,” “Next,” and “Finally” in later cycles functioned as a scaffolding bridge, enhancing students’ sense of accomplishment and self-efficacy in writing.

#### Feedback, Reflection, and Peer Collaboration

The Feedback and Reflection stage contributed to the development of a participatory and supportive classroom environment. Students emphasized the importance of peer collaboration and teacher feedback in revising and redrafting their writing. This collaborative atmosphere reduced learners’ fear of negative evaluation and encouraged them to view writing as a recursive process of discovering meaning rather than as a high-stakes final product. By observing their own progress across the four instructional cycles, from fragmented sentences to cohesive paragraphs, such as those illustrated in Figure 2: students reported significantly greater confidence in their English writing ability.



Trip went to Haberland at Udontani  
on Friday, 20<sup>th</sup> of January, 2023  
First, I went to Udontani for 2 hours.  
Next, I went to hotel and ate ice cream.  
Then I went to Haberland and played for 2 hours.  
Finally, I went to hotel and sleep.



Hello my nick name is afrika the beach  
you may think this is  
a normal trip but trust me it is not a normal trip. Let's begin  
so it was a good day even tho it was raining it was a  
good day cuz my family is here with me. I was getting  
ready and we got in the car I slept for 2 hours.  
We got on a boat on day 2 and after we got to the  
hotel. We ate lunch then I saw it. The beach was  
very pretty. the water was clear as day. I jumped  
into the water. but my leg was hurting so I got out  
of the water I told my mom and then we had ice-cream  
finally we got to see the fishes. I was so happy  
I love the ocean/beach  
Thank you for listening bye bye

Figure 3: Example of the students' writing progress from cycle 3 – 4, demonstrating the shift toward cohesive narrative construction.

The findings suggest that the CALM–PBA approach cultivated a supportive and adaptive ecosystem. The high levels of behavioral, emotional, and cognitive engagement confirm that when instruction is contextually grounded and systematically scaffolded within the Zone of Proximal Development (ZPD), young EFL learners can overcome linguistic barriers and achieve meaningful growth in literacy development (Pinweha, 2025; Sudathip et al., 2025).

## ■ Synthesis of Findings

Collectively, the results across all three research objectives provide robust empirical evidence that the CALM–PBA instructional approach is a highly effective innovation for enhancing English writing proficiency among primary EFL learners. The synthesis of quantitative data and qualitative artifacts reveals a comprehensive improvement in both the cognitive and linguistic dimensions of writing.

Firstly, the quantitative achievement was statistically profound. The transition from a pre-test mean of 38.92 percent to a post-test mean of 87.32 percent, supported by a very large effect size (Cohen's  $d = 4.05$ ), confirms that the model successfully bridged the initial learning gap. This success is further validated by the efficiency ratio ( $E1/E2 = 80.05/87.32$ ), which surpassed the 80/80 standard. These figures are not merely isolated statistics but reflect the cumulative success of the four adaptive cycles, where the passing rate reached a perfect 100 percent in the final stages.

Secondly, the qualitative development traced across the cycles provides a “visual proof” of the model's impact. The progression from fragmented, L1-influenced intent in Cycle 1 (*for example, “I want to go to the zoo and I want to eat a KFC”*) to cohesive, multi-sentence narratives in Cycle 4 (*for example, “First I went to beach... Next I went to played ball... finally we went back to home”*) illustrates a growing metacognitive control. The students' ability to internalize the recursive stages of PBA, moving from planning to meaningful revision, demonstrates that they no longer view writing as a mechanical translation task but as a tool for personal expression.

The theoretical synergy between CALM's adaptive mechanism and PBA's structured stages created a “pedagogical ecosystem” that balanced academic rigor with affective security. By providing heavy scaffolding in the early “Trip” contexts and systematically fading it during the “Career” contexts, the teacher ensured that every learner remained within their Zone of Proximal Development, as proposed by Vygotsky (1978). This adaptive responsiveness was the key driver behind the high engagement score (mean = 4.13), as students felt both challenged and supported.

In conclusion, these findings contribute significant empirical support for the implementation of adaptive, process-based instruction in primary EFL settings. In a context like Thailand, where learner diversity and writing anxiety are prevalent, the CALM–PBA model offers a scalable and effective solution. It proves

that when instructional structures are flexible enough to respond to learners' immediate contexts, young EFL students can overcome linguistic barriers and experience tangible success in their literacy development.

## ■ Discussion

The empirical evidence derived from this study confirms that the CALM–PBA model is a potent pedagogical innovation capable of transforming English writing instruction in primary EFL contexts. The discussion is organized around four critical pillars that highlight the model's robustness, instructional value, and theoretical significance.

### Superior Efficiency and High-Magnitude Impact

The quantitative outcomes of this research extend beyond mere statistical significance and demonstrate a high-magnitude impact on learner competency. The efficiency ratio of  $E1/E2 = 80.05/87.32$  not only exceeded the rigorous 80/80 benchmark but also reflects a systemic balance between the instructional process and the learning product.

In addition, the Effectiveness Index of 0.7924, together with a Cohen's  $d$  value of 4.05, indicates a normalized learning gain that is exceptionally rare in conventional EFL settings. This very large effect size suggests that the CALM–PBA integration successfully addressed the learning gap that traditional product-oriented approaches often fail to close. The findings demonstrate that when instruction is strategically structured while remaining adaptively responsive, measurable learning success is not only achievable but also sustainable.

It is important, however, to interpret this exceptionally large effect size ( $d = 4.05$ ) with appropriate critical transparency, as several converging factors likely contributed to its magnitude. First, the participants' very low baseline performance ( $M = 38.92\%$ ) created a substantial ceiling of potential improvement, as students with limited prior writing experience tend to exhibit larger gains from structured intervention than those with stronger foundational skills. Second, the strong alignment between instructional activities and assessment criteria—whereby students practised tasks that closely mirrored the rubric domains—may have amplified post-test scores beyond what would be expected in a less tightly aligned design. Third, the intensive and cyclical nature of the intervention, including continuous formative feedback embedded within each CALM stage, provided a density of targeted practice that is rarely achieved in conventional classroom settings. Fourth, the introduction of an innovative and contextually relevant instructional approach may have produced a novelty effect, temporarily boosting learner motivation and effort. Finally, the relatively small sample size ( $n = 16$ ) is a recognized statistical factor that can inflate observed effect sizes, particularly when variance is low within a homogeneous group. Taken together, these factors should encourage readers to interpret the reported  $d$  value as indicative of a high-impact instructional context rather than as a universal benchmark for the CALM–PBA model across all settings.

### Mitigation of Cognitive Overload through Structural Clarity

A key strength of the CALM–PBA model lies in its capacity to mitigate cognitive overload, which is a major barrier for young EFL writers. Through the adoption of the Process-Based Approach, writing was

transformed from a high-stakes and intimidating task into a sequence of manageable cognitive phases, namely planning, drafting, revising, and editing, as conceptualized by Flower and Hayes (1981)

The results reinforce the theoretical premise that writing development is most effective when learners gain metacognitive control over these stages (Hyland, 2003). Unlike traditional approaches that emphasize immediate grammatical accuracy, the Process-Based Approach allowed students to prioritize meaning-making (Zamel, 1982). This pedagogical shift explains the observed improvements in content elaboration, logical sequencing, and overall textual cohesion.

#### Adaptive Pedagogy as the Catalyst for Individual Growth

The most distinctive contribution of this study is the integration of the Context-Adaptive Learning Model as an adaptive engine within the instructional framework. While the Process-Based Approach provided a clear pedagogical roadmap, CALM supplied the instructional agility required to respond to real-time classroom variability.

The qualitative progression observed in students' writing, from fragmented subject-verb constructions in Cycle 1 to more sophisticated and coherent narratives in Cycle 4, can be directly attributed to adaptive scaffolding. By continuously monitoring students' diagnostic profiles and readiness levels, as suggested by Sudathip et al. (2026), the teacher was able to deliver just-in-time support, such as visual verb cards and sequential markers. These supports were systematically faded as learners developed greater independence. This finding confirms the model's effectiveness in operationalizing Vygotsky's (1978) Zone of Proximal Development within a classroom context characterized by limited and variable resources.

#### Affective Mastery through Contextual Relevance

Beyond linguistic and cognitive gains, the CALM-PBA model also fostered significant affective mastery, as evidenced by the high engagement mean score of 4.13. The findings suggest that student engagement functions largely as a result of contextual relevance. By incorporating writing topics that reflected learners' cultural backgrounds and personal experiences, such as dream careers and local trips, the model effectively lowered students' affective filter, as described by Pinweha (2025).

The progression from simple expressions such as "I want to go to the zoo" in the early cycles to emotionally expressive and cohesive paragraphs, including statements like "I am so happy!", indicates that learners developed a sense of ownership and confidence in their writing. This outcome aligns with Darling-Hammond and Bransford (2005), who emphasize that adaptive teaching practices are fundamental to achieving equity and effectiveness in education.

#### A Scalable Pedagogical Ecosystem

Collectively, the results affirm that the CALM-PBA integration creates a "Pedagogical Ecosystem" that is simultaneously structured, adaptive, and learner-centered. It provides a viable solution to the long-standing challenges of Thai primary English education, where learner diversity and writing anxiety often hinder progress. The findings underscore the broader potential of this model as a scalable framework for primary English reform, not only in Thailand but across multilingual and resource-variable contexts throughout Asia.

### Conditions and Transferability of the CALM–PBA Model

While the CALM–PBA model has demonstrated promising outcomes in the present context, its broader applicability warrants a more nuanced discussion of the pedagogical principles that underpin its effectiveness, the conditions necessary for successful implementation, and the inherent limitations associated with direct replication across different educational environments. In terms of transferable principles, the model’s effectiveness appears to stem primarily from its core pedagogical commitments—namely, process-oriented writing instruction, adaptive scaffolding calibrated to learners’ Zone of Proximal Development, contextualized task design, and the systematic use of formative feedback—rather than from the specific classroom or cultural context in which it was developed. These principles are theoretically robust and broadly applicable across diverse EFL settings. However, successful implementation in other contexts is likely contingent upon several key conditions. Teachers must possess the diagnostic competence to identify learners’ readiness levels and the instructional agility to modify their scaffolding in real time. Furthermore, the model requires a classroom environment that supports iterative drafting and peer collaboration, alongside manageable class sizes that permit individualized monitoring and feedback. Finally, it is important to acknowledge that the magnitude of improvement observed in this study may not be directly replicable in settings where students enter with stronger baseline skills, where intervention time is limited, or where professional development support for adaptive pedagogy is insufficient. Future applications of the CALM–PBA model should therefore be treated as context-sensitive adaptations rather than wholesale replications, with appropriate calibration of expectations regarding effect size.

### ■ Conclusion

This research successfully developed and evaluated an integrated instructional innovation that combined the Context-Adaptive Learning Model (CALM) with the Process-Based Approach (PBA). The model was specifically designed to address the challenges of English writing instruction for Grade 4 EFL learners in Thailand. Through a rigorous Research and Development framework implemented via Classroom Action Research, the findings clearly indicate that the CALM–PBA model is a highly effective, efficient, and engaging pedagogical framework for primary EFL contexts.

#### Achievement of Instructional Efficiency and Effectiveness

The intervention provided conclusive quantitative evidence of its instructional success. The CALM–PBA model met and exceeded the predetermined 80/80 efficiency criterion, achieving a process efficiency of 80.05 percent and a product efficiency of 87.32 percent. This level of efficiency demonstrates that the integration of adaptive teaching steps with structured writing phases consistently supported the intended learning outcomes throughout the intervention.

In addition, the Effectiveness Index was calculated at 0.7924, indicating a high level of normalized learning gain. This result suggests that students achieved nearly 80 percent of their total possible improvement. The statistical significance of this growth was confirmed through a paired-samples t-test, and the very large effect size of 4.05 further underscores the transformative impact of the CALM–PBA model on

students' writing ability. Notably, this improvement represents a substantial progression beyond the baseline pre-test mean of 38.92 percent.

#### Qualitative Transformation of Writing Performance

Beyond numerical achievement, the study revealed a profound qualitative transformation in students' writing performance. Across the four instructional cycles, learners demonstrated a clear developmental trajectory, moving from fragmented subject-verb patterns and isolated lexical items toward the production of cohesive and well-structured paragraphs.

Longitudinal analysis of student writing drafts showed marked improvements in syntactic control, lexical range, and idea organization. By Cycle 4, students were able to effectively employ sequential connectors such as "First," "Next," and "Finally," along with descriptive adjectives, to express ideas related to personally meaningful topics. This qualitative growth confirms that the adaptive scaffolding embedded within the CALM framework enabled learners to operate within their Zone of Proximal Development with increasing independence, accuracy, and fluency.

#### Affective Mastery and Learner Engagement

The CALM-PBA model also demonstrated strong effectiveness in the affective domain. Student engagement data revealed a high mean score of 4.13, indicating elevated levels of motivation, confidence, and positive attitudes toward writing. The incorporation of contextual relevance, particularly through topics aligned with students' personal interests and local environments, played a crucial role in lowering learners' affective filter.

As a result, writing was no longer perceived as a mechanical translation task but rather as a meaningful and secure process of discovering meaning. This shift enhanced students' self-efficacy and increased their willingness to participate actively in collaborative writing activities, thereby reinforcing both emotional engagement and sustained learning motivation.

#### Final Synthesis and Policy Implications

In summary, the CALM-PBA model represents a significant pedagogical innovation that aligns closely with the current educational reform priorities of the Office of the Basic Education Commission in Thailand. By emphasizing learner-centeredness, active participation, and real-time instructional adaptivity, the model offers a balanced framework in which CALM ensures responsiveness to learner diversity and classroom realities, while PBA provides a cognitive roadmap for developing writing as a recursive and meaningful skill.

The success of this study suggests strong implications for primary EFL instruction. The CALM-PBA model offers a scalable and replicable framework for teachers seeking to enhance both academic effectiveness and emotional engagement among young learners. Ultimately, the model establishes a pedagogical ecosystem that can be adapted to similar multilingual and resource-variable contexts across Asia, providing a viable pathway toward sustainable literacy development in the twenty-first century.

## ■ Limitations

While the findings of this research offer compelling evidence regarding the efficacy of integrating the Context-Adaptive Learning Model (CALM) with the Process-Based Approach (PBA), it is imperative to acknowledge several inherent limitations that may impact the interpretation and broader applicability of the results.

### 1. Methodological Constraints of Research Design

The study utilized a one-group pretest–posttest action research design, which focused on the longitudinal development within a specific classroom ecosystem. While this approach provided a granular and in-depth understanding of how adaptive instruction influences individual writing growth, the absence of a parallel control or comparison group remains a significant constraint. Consequently, it is difficult to isolate the CALM–PBA intervention as the sole variable responsible for the observed gains, as internal validity threats such as maturation or testing effects cannot be entirely ruled out. Therefore, while the results demonstrate a strong correlation between the model and student progress, they should not be interpreted as definitive evidence of a causal relationship. To address this limitation, future studies are encouraged to employ a quasi-experimental design incorporating a matched control group receiving conventional instruction, or, where ethical and logistical conditions permit, a randomized controlled trial. Such designs would enable stronger causal claims regarding the CALM–PBA model’s effectiveness and would also allow for the examination of moderating variables such as teacher experience, learner proficiency level, and instructional context. Additionally, replication with larger, more diverse samples would enhance the generalizability of the findings beyond the present single-classroom context.

### 2. Temporal Scope and Skill Retention

The intervention was conducted over a relatively concise duration of four instructional cycles, totaling eight contact hours. Although this period was sufficient to observe immediate pedagogical breakthroughs and a "lexical explosion" among the Grade 4 participants, the short-term nature of the study limits our understanding of long-term skill retention. It remains unclear whether the observed improvements in syntactic control and metacognitive awareness would be sustained without continuous teacher scaffolding over an extended academic semester or year. A more longitudinal observation would be necessary to capture the nuanced "fading" of support and the subsequent transition to total learner autonomy. In particular, the question of whether the gains in writing fluency and sequential text organization observed by Cycle 4 represent durable cognitive restructuring or a temporary performance boost facilitated by the intensive scaffolding environment warrants serious consideration. Research in EFL writing development suggests that the consolidation of process-based strategies typically requires sustained practice across multiple academic terms (Hyland, 2019). Given the eight-hour timeframe of the present study, readers should interpret the post-test gains as reflecting immediate learning outcomes rather than confirmed long-term proficiency. Future research should therefore incorporate delayed post-tests administered four to twelve weeks after the intervention concludes, as well as longitudinal tracking of

participants across an academic year, to assess the durability of writing improvements and the degree to which learners can apply CALM–PBA strategies independently in new writing contexts.

### 3. Genre Specificity and Linguistic Scope

The assessment in this research was purposefully restricted to paragraph-level narrative writing, which was deemed developmentally appropriate for Grade 4 EFL learners. However, the successful outcomes within this specific genre may not automatically transfer to more cognitively demanding rhetorical modes. Writing proficiency is multi-faceted; thus, the effectiveness of the CALM–PBA framework in fostering descriptive, expository, or argumentative writing, where logical reasoning and evidence-based structure are paramount, remains to be explored. The current findings, therefore, represent a "foundational success" rather than a comprehensive mastery of diverse English writing genres.

### 4. Variables of Implementation Fidelity and Contextual Diversity

The study was localized within a single primary school context, under specific jurisdictional conditions of the Office of the Basic Education Commission (OBEC) in northeastern Thailand. Several uncontrolled contextual variables, including the specific level of teacher expertise in adaptive pedagogy, available classroom technological resources, and the relatively small class size ( $n = 16$ ), may have influenced the fidelity of the implementation. These factors raise questions regarding external validity. The success of the CALM–PBA model in larger, more resource-variable, or urban-multilingual settings remains an area for further investigation through multi-site replication.

## ■ Recommendations

### Recommendations for Pedagogical Practice

The success of the CALM–PBA model in this study leads to several strategic recommendations for EFL practitioners, curriculum developers, and educational stakeholders aiming to revitalize primary-level writing instruction:

1. Shift from Product to Process-Oriented Paradigms: It is highly recommended that teachers move beyond traditional rote-copying and grammar-heavy tasks. Instruction should explicitly guide learners through the recursive stages of Planning, Drafting, Revising, and Editing. By demystifying the writing process, educators can transform writing from a daunting "one-off" assessment into a manageable, developmental journey that fosters student confidence.

2. Operationalize Adaptive Teaching through CALM: Practitioners should integrate Diagnostic Assessment and Ongoing Observation as core classroom routines. Rather than adhering to a rigid lesson plan, teachers must exercise "instructional agility", adjusting scaffolding (e.g., providing or fading word banks and graphic organizers) in real-time based on the learners' immediate Zone of Proximal Development (ZPD).

3. Institutionalize Contextual Relevance: To lower the "Affective Filter," curriculum designers should move away from generic textbook topics and instead integrate content that mirrors students' local culture, personal identities, and daily lived experiences. As evidenced in this study, topics like "Dream Careers" or "Local Trips" act as powerful catalysts for linguistic engagement and "lexical explosion."

4. Leverage Multimodal and Collaborative Scaffolding: Teachers should utilize diverse support mechanisms, including graphic organizers, visual prompts, and digital storytelling tools. Furthermore, Collaborative Writing Tasks and peer-feedback sessions should be encouraged to transform writing into a social and communicative act, reducing individual anxiety and promoting shared ownership of learning.

5. Foster Metacognitive and Reflective Habits: Reflection should be an integral part of every lesson cycle. Encouraging young learners to reflect on "how" they write and "what" challenges they overcame helps develop self-monitoring and metacognitive skills, which are essential for long-term academic success and autonomous learning.

### Recommendations for Future Research

To further validate and expand upon the findings of this study, the following avenues for future scholarly inquiry are proposed:

1. Advanced Experimental Methodologies: Future research should transition from one-group designs to Quasi-experimental or Randomized Controlled Trials (RCTs). Utilizing a control group would allow for a more rigorous comparison between the CALM-PBA model and traditional methods, providing stronger evidence for causal inference and instructional efficacy.

2. Longitudinal Studies on Skill Retention: There is a critical need for longitudinal investigations that track learners over an entire academic year. Such studies could examine the long-term retention of writing strategies and determine whether the observed gains in syntactic control and fluency persist after the intervention ends.

3. Expansion of Linguistic Domains and Genres: While this study focused on paragraph-level narratives, future research should explore the adaptability of the CALM-PBA framework to other language domains, such as Speaking and Reading Comprehension, or more complex rhetorical genres, including expository and argumentative writing.

4. Teacher Cognition and Implementation Fidelity: Inquiry into how different teachers interpret, adapt, and enact the CALM-PBA model is vital. Understanding the variables that influence implementation fidelity, such as teacher expertise, classroom resources, and school culture, would provide insights into the model's scalability across varied educational settings.

5. Multi-site Replication and Generalizability: Replicating this study across diverse geographical and socioeconomic contexts (e.g., rural vs. urban schools, or bilingual vs. monolingual environments) would strengthen the external validity of the model and help identify necessary adaptations for different learner profiles.

Through these research trajectories, the academic community can deepen its understanding of Adaptive Writing Pedagogy, ultimately contributing to the development of scalable, context-responsive instructional models that enhance literacy outcomes for young EFL learners globally.

### References

Arici, A. F., & Kaldırım, E. (2021). The effect of process-based writing approach on writing success: A meta-analysis. *International Journal of Education and Literacy Studies*, 9(1), 125–135.

- Arici, I., & Kaldırım, A. (2021). Effects of the process-based writing approach on EFL learners' writing anxiety and performance. *International Online Journal of Education and Teaching*, 8(3), 1342–1358. <https://iojet.org/index.php/IOJET/article/view/1377>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.
- Darling-Hammond, L., & Bransford, J. (Eds.). (2005). *Preparing teachers for a changing world: What teachers should learn and be able to do*. Jossey-Bass.
- Fairman, J. C., Smith, W. C., Beaudry, J. S., & Miller, K. J. (2020). *The power of adaptive teaching: Real-time decisions for student success*. Corwin Press.
- Flower, L., & Hayes, J. R. (1981). A cognitive process theory of writing. *College Composition and Communication*, 32(4), 365–387. <https://doi.org/10.2307/356600>
- Hashemnezhad, H. (2015). A process approach to teaching writing in EFL classrooms. *International Journal of Applied Linguistics and English Literature*, 4(3), 99–103. <https://doi.org/10.7575/aiac.ijalel.v.4n.3p.99>
- Hyland, K. (2003). *Second language writing*. Cambridge University Press.
- Hyland, K. (2019). *Second language writing* (2nd ed.). Cambridge University Press. <https://doi.org/10.1017/9781108635547>
- Hyland, K. (2019). Second language writing and teaching: Context and community. *Journal of Second Language Writing*, 46, 100–115. <https://doi.org/10.1016/j.jslw.2019.100662>
- Intasena, A., Srimunta, T., & Yotha, N. (2025). Developing a model to enhance teachers' active learning instructional management in central northeastern Thailand. *EDUPIJ*. <https://doi.org/10.22521/edupij.2025.16.209>
- Kemmis, S., & McTaggart, R. (1988). *The action research planner*. Deakin University Press.
- Kongsom, T. (2021). The effects of process-based writing instruction on Thai EFL university students' writing performance. *LEARN Journal*, 14(1), 68–90. <https://so04.tci-thaijo.org/index.php/LEARN/article/view/249267>
- Kwangmuang, P. (2021). The development of learning innovation to enhance higher-order thinking skills for students in Thailand junior high schools. *Heliyon*, 7(e07309). <https://doi.org/10.1016/j.heliyon.2021.e07309>
- Pinweha, S. (2025). The effects of differentiated pronunciation instruction via a virtual learning environment on primary-school Thai EFL teachers. *PASAA Journal*, 70, 164–203. [https://www.culi.chula.ac.th/Images/asset/pasaa\\_journal/file-75-972-i60rjw723924.pdf](https://www.culi.chula.ac.th/Images/asset/pasaa_journal/file-75-972-i60rjw723924.pdf)
- Sermsook, J., Limruangrong, N., & Rungruang, W. (2017). An analysis of errors in written English of Thai EFL students. *English Language Teaching*, 10(3), 101–110. <https://doi.org/10.5539/elt.v10n3p101>
- Silpcharu, T. (2020). *Research and statistical data analysis with SPSS* (5th ed.). SE-Education. [in Thai]
- Sudathip, P., Yuankrathok, P., & Chuanon, C. (2026). *A context-adaptive learning model to enhance English teaching competency for preservice teachers* [Unpublished doctoral dissertation]. Faculty of Education, Khon Kaen University, Thailand.

- Tangkiengsirisin, S. (2019). Using the process approach to improve writing ability of Thai university students. *LEARN Journal*, 12(2), 52–69. <https://so04.tci-thaijo.org/index.php/LEARN/article/view/210570>
- Thongthee, S. (2020). *Effects of the active learning approach on the English achievement of Thai EFL secondary school students* [Independent study]. Thammasat University.  
[https://ethesisarchive.library.tu.ac.th/thesis/2020/TU\\_2020\\_6221042291\\_14454\\_14553.pdf](https://ethesisarchive.library.tu.ac.th/thesis/2020/TU_2020_6221042291_14454_14553.pdf) [in Thai]
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry*, 17(2), 89–100. <https://doi.org/10.1111/j.1469-7610.1976.tb00381.x>
- Zamel, V. (1982). Writing: The process of discovering meaning. *TESOL Quarterly*, 16(2), 195–209.  
<https://doi.org/10.2307/3586792>