Journal of English Teaching
e-ISSN: 2622-4224 | p-ISSN: 2087-9628
http://ejournal.uki.ac.id/index.php/jet
Volume 12. Number 2, June 2026, pp. 160-178

Enhancing Writing Quality and Higher-Order Thinking Skills among EFL Learners through Collaborative Writing

Jitlada Moonma[1]*

Article History:
Received: 17/03/2026
Revised : 28/04/2026
Accepted: 10/05/2026
Available Online: 30/06/2026

Keywords:
Collaborative writing, critical thinking, English as a Foreign Language (EFL), English language learning, higher-order thinking skills

ABSTRACT
This study investigated the extent to which collaborative writing activities enhanced writing quality and higher-order thinking skills among Thai EFL learners. Employing a quasi-experimental mixed-methods design, the study involved 65 second-year English majors enrolled in a writing course at a public university in northern Thailand during the 2025 academic year. Participants were purposively selected and completed writing tasks under three instructional conditions: group, pair, and individual writing. Quantitative data were obtained from writing assessments and self-assessment questionnaires, while qualitative data were collected through semi-structured interviews. Repeated-measures ANOVA revealed a significant effect of instructional condition on writing quality, $F(2,128) = 24.67$, $p < .001$, $\eta^2 = .28$. Group writing produced the highest scores ($M = 11.39$), followed by pair writing ($M = 10.31$) and individual writing ($M = 9.16$). Group-based collaboration also promoted higher levels of analyzing, evaluating, and creating. Interview findings indicated that collaborative interaction fostered idea generation, peer scaffolding, reflective thinking, and confidence development. These findings underscore the pedagogical value of collaborative writing for enhancing cognitive engagement and writing performance in EFL classrooms.

[1] Lampang Rajabhat University, Lampang, Thailand. Email: jitlada.moon@gmail.com
https://orchid.org/0000-0002-9004-3666 *Corresponding author

INTRODUCTION

Higher-order thinking has become a central objective in contemporary English language education, particularly in English as a Foreign Language (EFL) contexts where learners are expected to engage critically with information, construct arguments, and communicate effectively in academic settings. Critical thinking, commonly associated with higher-order cognitive processes such as analyzing, evaluating, and creating, enables learners to move beyond surface-level language use toward deeper engagement with ideas and discourse (Facione, 2023). In EFL classrooms, the integration of higher-order thinking is increasingly viewed as essential for developing learners' academic literacy, problem-solving ability, and communicative competence.

Despite its recognized importance, the development of critical thinking remains challenging in many EFL contexts. Traditional teacher-centered instructional approaches, an emphasis on rote memorization, and limited opportunities for interaction often restrict learners' cognitive engagement and reflective thinking. Previous research has indicated that EFL learners frequently demonstrate difficulties in generating arguments, evaluating evidence, and synthesizing information during writing tasks (Liu & Sihes, 2025). Consequently, there is a growing need for instructional approaches that actively promote cognitive engagement alongside language development.

Collaborative writing has emerged as a promising pedagogical approach for addressing these challenges. Collaborative writing refers to the process in which learners jointly plan, draft, revise, and edit written texts through interaction and shared decision-making. Grounded in sociocultural theory and constructivist learning principles, collaborative writing encourages learners to negotiate meaning, exchange perspectives, and scaffold one another's learning through social interaction (Vygotsky, 1987). Through these processes, learners are encouraged to analyze information, evaluate alternative viewpoints, and co-construct knowledge, thereby facilitating the development of higher-order thinking skills.

Although previous studies have reported the positive effects of collaborative writing on EFL learners' writing performance (Kitjaroonchai, 2022; Latifi et al., 2021; Pardede, 2024), most investigations have focused primarily on linguistic outcomes rather than the cognitive processes underlying collaborative interaction. Moreover, empirical evidence comparing group, pair, and individual writing configurations in relation to higher-order thinking remains limited, particularly in Thai EFL contexts. Consequently, little is known about how varying levels of interaction mediate learners' analytical, evaluative, and creative thinking during the writing process. Furthermore, there has been insufficient comparative analysis across group, pair, and individual writing modes to explain how varying levels of interaction influence learners' cognitive engagement and writing development. Therefore, the present study investigates collaborative writing as a socially mediated and cognitively interactive process that supports both writing quality and higher-order thinking development among Thai EFL learners.

LITERATURE REVIEW

Critical Thinking in EFL Contexts

Scholars have proposed various definitions of critical thinking (CT), each reflecting different disciplinary perspectives and theoretical orientations. Despite extensive scholarly discussion, no universally accepted definition of CT currently exists. Lai (2011) categorized major conceptualizations of critical thinking into three broad perspectives: psychological, philosophical, and educational, each emphasizing distinct dimensions of reasoning and cognitive processes. Within educational contexts, Bloom's Taxonomy has been widely adopted as a conceptual framework for identifying and classifying critical thinking skills.

According to Bloom (1956) and the revised taxonomy proposed by Anderson and Krathwohl (2001), cognitive processes can be categorized into lower-order and higher-order thinking skills. Higher-order thinking involves more complex cognitive operations, including analyzing, evaluating, and creating, which extend beyond basic recall and comprehension. In the present study, a conceptual framework of critical thinking was developed to guide the examination of higher-order thinking within collaborative writing activities (see Figure 1).

The framework integrates three interrelated phases of critical thinking that correspond to different stages of the collaborative writing process. Throughout these stages, learners engage in a range of cognitive activities in which lower-level thinking skills provide the foundation for more advanced forms of cognitive engagement. Consequently, higher-order thinking is viewed as a hierarchical and progressive process that relies on learners' prior understanding, interpretation, and organization of information. For example, effective evaluation of written texts requires more than the recognition of surface-level meaning. Learners must first comprehend and interpret information before engaging in deeper inferential analysis and evaluative judgment. In this regard, the development of higher-order thinking depends on the successful integration of lower-order cognitive processes. This relationship highlights the interconnected and developmental nature of critical thinking within the writing process.

Figure 1. Critical Thinking Skills Taxonomy and Collaborative Writing
Note. Adapted from Anderson and Krathwohl (2001).

Guamanga (2025) emphasizes metacognition as a vital psychological factor in nurturing critical thinking in higher education. It calls attention to self-assessment, evidence evaluation, and pedagogical approaches like problem-based learning as catalysts for deeper reasoning. Table 1 summarizes the different aspects of critical thinking skills in different dimension.

Consequently, understanding what critical thinking means in practice rather than discussing its theoretical definition might be more significant (Davies and Barnett, 2015; Moore, 2013). Moore (2013) asserts that research on critical thinking has a tendency to abstractly define the ability and separate it from useful applications. Davies and Barnett (2015) suggested that higher-order thinking has commonly been approached as a collection of internal cognitive processes, while the contribution of social interaction and collaborative contexts has received comparatively less attention. Therefore, how educators might include thinking critically into instruction will be detailed in the following section.

Table 1

The Six Classifications of Revised Bloom's Taxonomy for the Teaching and Learnng Process (Adapted from Anderson and Krathwohl, 2001)

Learning Levels	Definition	Sample cues
Creating	Generating new ideas, products, or ways of viewing things, designing, constructing, planning, producing, inventing.	produce, design
Evaluating	Justifying a decision, checking, hypothesizing, critiquing, experimenting, judging	review, evaluate, assess
Analyzing	Breaking information into parts to explore understanding and relationships, comparing, organizing, deconstructing, interrogating, finding	distinguish, arrange, attribute
Applying	Using the information in another familiar situation, implementing, carrying out, using, executing	execute, implement, apply
Understanding	Explaining ideas or concepts, interpreting, summarizing, paraphrasing, classifying, explaining	clarify, categorize, classify, recollect, identify, contrast
Remembering	Recalling information, recognizing, listing, describing, retrieving, naming, finding	remember, recognize, write, list, label

Collaborative Writing and Higher-Order Thinking

The integration of higher-order thinking skills into classroom instruction has become an important objective in contemporary education. Nevertheless, critical thinking has historically received less emphasis than other cognitive abilities within language education contexts (Goodsett, 2020). To address this issue, several instructional approaches have been proposed to facilitate the development of critical thinking skills. Ennis's instructional framework, as cited in Abrami et al. (2015), categorizes these approaches into three major types: general, infusion, and immersion approaches. The general approach emphasizes the explicit instruction of critical thinking principles through direct teaching, guided practice, and structured exercises designed to develop reasoning skills (Paul & Elder, 2019). In contrast, the infusion approach integrates critical thinking instruction within subject-specific content areas, enabling learners to apply analytical and evaluative thinking while engaging with disciplinary knowledge (Bensley & Murtagh, 2021). This approach has also been associated with metacognitive training and reflective learning practices that promote deeper cognitive

engagement (McLaughlin & McGill, 2017). Meanwhile, the immersion approach encourages learners to develop critical thinking implicitly through active engagement with meaningful tasks and authentic learning experiences without direct instruction of critical thinking concepts (Huber et al., 2016). Previous research suggests that combining explicit critical thinking instruction with authentic real-world application may provide the most effective means of developing higher-order thinking skills (Abrami et al., 2015).

Although critical thinking is widely regarded as a transferable competence, scholars have argued that its development and application may be influenced by disciplinary contexts and domain-specific knowledge (Davies & Barnett, 2015; Lai, 2011). Consequently, recent studies have emphasized the importance of discipline-specific instructional strategies that align with the unique cognitive demands of different academic fields, including language education, psychology, healthcare, and the humanities (Carvalho et al., 2017). Within EFL contexts, collaborative writing has increasingly been recognized as a pedagogical approach capable of fostering higher-order thinking skills. Through collaborative interaction, learners are encouraged to exchange ideas, negotiate meaning, evaluate alternative perspectives, and jointly construct knowledge. These processes naturally engage learners in analytical, evaluative, and creative thinking. Furthermore, collaborative writing activities create opportunities for peer scaffolding, reflective discussion, and problem-solving, all of which contribute to deeper cognitive engagement. Recent reviews have identified several instructional practices that effectively support critical thinking development, including individual inquiry, collaborative discussion, experiential learning, and mentorship-based learning activities (Abrami et al., 2015). Among these approaches, collaborative discussion and authentic task-based learning have demonstrated particularly strong effects on learners' cognitive development. Despite these promising findings, practical implementation of collaborative writing for higher-order thinking development in EFL classrooms remains underexplored, particularly in Asian educational contexts. Therefore, further empirical investigation is needed to examine how collaborative writing activities may contribute to the development of higher-order thinking skills among EFL learners.

Writing Process Theory

A closer examination of the writing process within working memory, together with Haase's (2010) model of critical thinking, reveals several conceptual similarities between writing development and higher-order cognitive processes (see Figure 2). In particular, the planning stage of writing corresponds closely with the application of conceptualization and knowledge activation, both of which are essential during the initial stages of idea generation. As writers progress to the drafting or "translation" stage, as proposed by Flower and Hayes (1981), they engage in analytical and synthesizing processes that require the organization, interpretation, and integration of ideas. Subsequently, the revising and editing stages reflect evaluative thinking, during which writers critically examine the coherence, accuracy, and effectiveness of their written texts (Flower & Hayes, 1981; Haase, 2010).

Figure 2 illustrates the cognitive process model of writing proposed by Flower and Hayes (1981), which conceptualizes writing as a recursive and goal-oriented cognitive activity. According to this model, writers actively engage in multiple cognitive processes while composing texts. At the beginning of a writing task, writers attempt to interpret task requirements, identify communicative purposes, and consider audience expectations. They may also retrieve relevant prior knowledge and previous experiences from long-term memory to support idea development and content organization. Long-term memory plays a significant role in the writing process by supplying writers with background knowledge, rhetorical awareness, linguistic resources, and organizational strategies. Simultaneously, working

memory enables writers to manipulate and transform ideas into coherent written discourse. During the composing process, writers continuously plan, draft, revise, and reorganize their ideas in order to improve clarity, coherence, and overall text quality (Graham & Harris, 2018; Kim & Graham, 2022). Importantly, the writing process should not be viewed as a linear or mechanical activity. Rather, writing is a dynamic and recursive cognitive process in which planning, drafting, revising, and evaluating occur continuously and interactively. Such recursive processes require writers to employ higher-order thinking skills, including analysis, evaluation, reflection, and creativity, throughout the development of written texts (Graham et al., 2015).

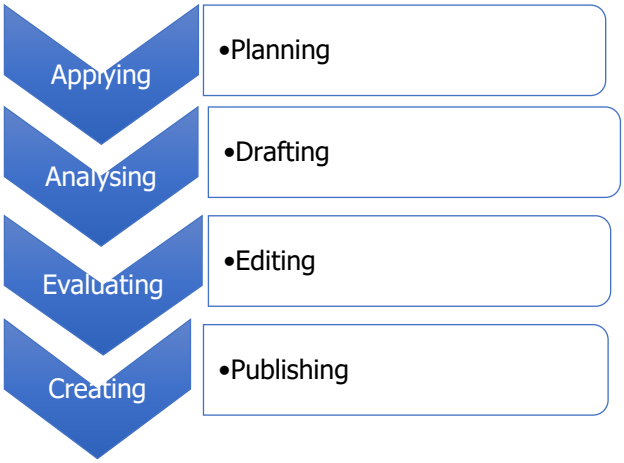

Figure 2. Connection between Critical Thinking Abilities and the Writing Process (Adapted from Flower and Hayes (1981) and Haase, 2010)

Empirical Studies

Recent empirical studies have continued to emphasize the importance of higher-order thinking skills in contemporary education, particularly within English language learning contexts. Earlier findings by Choy and Cheah (2009) remain highly relevant, as subsequent research has demonstrated that teachers' perceptions of students' higher-order thinking abilities significantly influence instructional practices, classroom interaction, and learning outcomes (Nguyen & Oanh, 2025). Teachers who value critical thinking are more likely to design learning activities that encourage analytical reasoning, reflective discussion, and problem-solving. Similarly, concerns regarding graduates' insufficient critical thinking abilities have persisted in recent educational research. Contemporary studies indicate that inadequate cognitive preparation may negatively affect learners' readiness for professional and workplace environments, where analytical and evaluative skills are increasingly required (John & Gabrele, 2025). As a result, educational institutions are under growing pressure to integrate higher-order thinking into classroom instruction and curriculum design. Within EFL contexts, studies focusing on language instruction have shown that communicative and learner-centered teaching approaches can significantly promote students' analytical and critical thinking abilities. Research involving English language instructors suggests that instructional practices aligned with higher-order thinking frameworks contribute positively to learners' cognitive engagement and language development (Lynda, 2023). Furthermore, curriculum interventions incorporating critical thinking tasks have been found to enhance learners' metacognitive awareness, reflective thinking, and problem-solving skills (Nguyen, 2020). More specifically, Kitjaroonchai and Suppasetseree (2021) found that collaborative

writing conducted through Google Docs facilitated meaningful peer interaction, knowledge sharing, and collaborative problem-solving among ASEAN EFL learners. Their findings suggest that collaborative writing environments can enhance learners' engagement in idea negotiation and joint text construction, both of which are closely associated with the development of higher-order thinking processes.

In contrast, traditional rote-learning approaches and form-focused writing activities commonly found in some ESL and EFL classrooms appear insufficient for developing higher-order thinking skills. Singh et al. (2020) reported that writing tasks emphasizing memorization and mechanical reproduction of information often fail to encourage deeper reasoning, analysis, and evaluation. These findings highlight the importance of designing instructional activities that require learners to actively interpret information, construct arguments, evaluate evidence, and engage in meaningful problem-solving. Taken together, previous empirical studies suggest that instructional approaches promoting interaction, reflection, and authentic cognitive engagement are essential for developing higher-order thinking skills in EFL contexts. Nevertheless, limited research has specifically investigated how collaborative writing activities contribute to higher-order thinking development among Thai EFL learners. Therefore, further empirical investigation in this area remains necessary.

Research Questions

1. How does collaborative writing affect Thai EFL learners' writing quality?
2. To what extent do group, pair, and individual writing conditions differentially influence learners' higher-order thinking skills?
3. What are Thai EFL learners' perceptions of collaborative writing activities in relation to higher-order thinking development?

RESEARCH METHODS

Research Design

This study adopted a mixed-methods design to examine how collaborative writing activities influenced Thai EFL learners' argumentative writing performance and higher-order thinking skills. The integration of quantitative and qualitative approaches enabled a more comprehensive exploration of learners' cognitive engagement, writing development, and perceptions of peer-mediated learning. Quantitative data focused on variations in writing performance and self-reported higher-order thinking across group, pair, and individual writing conditions, whereas qualitative data provided deeper insights into learners' experiences during the collaborative writing process. The instructional intervention was informed by the process-oriented writing framework of White and Arndt (1991), later contextualized for Thai EFL settings by Moonma and Kaweera (2022). Emphasis was placed on collaborative meaning-making, reflective engagement, and peer-supported revision throughout the writing process. A within-subject design was employed to allow all participants to experience each instructional condition, thereby reducing individual variability and enabling more reliable comparisons across writing contexts. To minimize potential order effects associated with the within-subject design, all instructional conditions were implemented using comparable argumentative writing tasks and standardized instructional procedures. Although the sequence of instructional conditions followed the course schedule, consistent task structure, instructional support, and assessment criteria were maintained across all conditions to reduce potential practice-related influences. Because the instructional conditions were implemented in a fixed sequence rather than counterbalanced, potential practice effects cannot be completely ruled out.

Participants

Participants consisted of 65 second-year students majoring in English who were taking a Writing II course at a public university in northern Thailand during the 2025 academic year. The sample consisted of 48 female and 17 male students, all of whom had completed the prerequisite Writing I course. To facilitate collaborative interaction and peer scaffolding, participants were categorized into novice (n = 9), intermediate (n = 34), and advanced (n = 22) proficiency levels based on their previous writing achievement. This classification enabled the formation of heterogeneous groups that encouraged knowledge sharing, collaborative problem-solving, and interaction among learners with varying levels of proficiency. Purposive sampling was employed to recruit participants who met the study criteria, and participation was entirely voluntary. Purposive sampling was employed because the participants had previously completed Writing I and possessed sufficient writing experience required for collaborative argumentative writing tasks.

Instruments

Data collection drew upon multiple instruments to capture both the cognitive and interactive dimensions of collaborative writing. First, a collaborative writing instructional model grounded in White and Arndt's (1991) process-oriented framework and adapted by Moonma and Kaweera (2022) was employed to structure the intervention. The eight-stage writing activity model illustrated in Figure 3 emphasized collaborative planning, drafting, revising, and reflective discussion across group, pair, and individual writing conditions, thereby encouraging active engagement throughout the argumentative writing process.

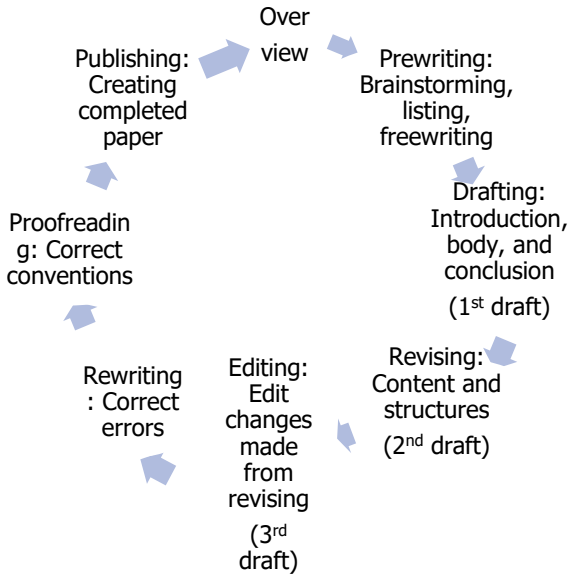

Figure 3. Writing Activity Model
(Adapted from White & Arndt, 1991 and Moonma J. & Kaweera C., 2022).
(Week 12/Writing in groups) (Week 13/Writing in pairs) (Week 14/Individual Writing)

Second, a self-assessment questionnaire presented in Table 2 and adapted from Pujiana et al. (2025) was utilized to examine learners' perceptions of higher-order thinking during collaborative writing activities. The instrument was theoretically informed by Anderson and Krathwohl's Revised Bloom's Taxonomy (2001) and Vygotsky's social constructivist perspective (1987), focusing on the dimensions of analyzing, evaluating, and creating. Content validity was confirmed by three experts in English language teaching and educational research, with all items achieving an IOC value of 1.00, indicating strong alignment between

the questionnaire items and the study objectives. The questionnaire demonstrated satisfactory internal consistency, with a Cronbach's alpha coefficient of .89, indicating good reliability.

Table 2
Questionnaire to Assess Students' Levels of Practice with Critical Thinking in Collaborative Writing (Adapted from Pujiana et al. (2025)

No	Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
	Creating					
1	Generating new sentences based on the knowledge gained from the participants.					
2	Gathering all the data and creating a paragraph based on the members' suggestions.					
	Evaluating					
3	Making choices and evaluating the sentences that were related to or unrelated to the subject.					
4	Choosing appropriate ideas that the members brainstormed.					
	Analyzing					
5	Separating data into components, such as arguments, proof, thesis statements, and justifications, in order to investigate a deeper comprehension.					
6	Classifying members' ideas into categories like arguments and supporting information.					
	Total					

Finally, semi-structured interviews were conducted to obtain deeper insights into learners' experiences and perceptions of collaborative writing and higher-order thinking development. In addition, students' argumentative writing performances were assessed using an analytic rubric adapted from Zhang (2019), which evaluated language use, organization, and content. To establish inter-rater reliability, three experienced raters independently scored all writing samples. The percentage agreement among raters was 89.2%, indicating a high level of scoring consistency. Cohen's Kappa (Cohen, 1960) coefficient was .82, suggesting almost perfect agreement according to Landis and Koch's (1977) interpretation criteria. In addition, the Intraclass Correlation Coefficient (ICC) yielded a value of .91 (95% CI [.87, .94]), demonstrating excellent reliability among raters. Following Koo and Li (2016), the ICC value indicated excellent inter-rater reliability. These findings confirm that the writing scores were sufficiently reliable for subsequent statistical analyses.

Procedures

The study was conducted over a 15-week period during the 2025 academic year. The instructional intervention comprised six collaborative writing lessons, each lasting approximately 240 minutes, designed to familiarize students with collaborative learning principles and the application of the eight-stage writing model. The intervention was designed to foster meaningful interaction, collaborative reasoning, and reflective engagement throughout the writing process.

The final stage of the intervention was implemented during Weeks 12–14, during which participants completed three writing tasks under different instructional conditions: group writing (Week 12), pair writing (Week 13), and individual writing (Week 14). To ensure consistency and comparability across conditions, all participants responded to the same argumentative prompt: "Is Online Learning More Effective than Classroom Learning?" This standardized procedure enabled a more reliable examination of variations in writing performance and higher-order thinking across instructional conditions.

During collaborative activities, participants were permitted to use Thai as a mediating language to reduce communication anxiety and facilitate idea generation, peer interaction, and collaborative problem-solving (Shehadeh, 2011; Pham & Hamid, 2021). After completing the writing tasks, participants were asked to complete a self-assessment questionnaire to evaluate the extent to which they engaged in higher-order thinking processes throughout the collaborative writing process. In addition, semi-structured interviews were conducted with six randomly selected participants to obtain deeper insights into their perceptions of higher-order thinking development through collaborative writing. Each interview lasted approximately 15–20 minutes and was audio-recorded with participants' consent.

Ethical considerations were rigorously maintained throughout the study. Prior to data collection, participants were informed of the study's objectives, research procedures, confidentiality measures, and their right to withdraw at any stage without penalty. Written informed consent was obtained from all participants. To protect participant confidentiality, all data were anonymized and securely stored on a password-protected computer, while hard-copy materials were kept in a locked storage cabinet accessible only to the researcher. All research data will be retained for three years and securely destroyed thereafter.

Data Analysis

A mixed-methods analytical framework was employed to provide a holistic account of students' writing development and higher-order thinking skills. Quantitative data obtained from the writing assessments and self-report questionnaires were analyzed through both descriptive and inferential statistical procedures. Means and standard deviations were calculated to evaluate patterns of performance and perceived cognitive engagement across the three instructional formats, namely group writing, pair writing, and individual writing. Repeated-measures ANOVA was employed to determine statistically significant differences among the instructional conditions, as all participants experienced each condition during the intervention. Post hoc comparisons using Bonferroni adjustments were subsequently conducted to identify specific differences while controlling for Type I error. Furthermore, effect size measures were generated to evaluate the magnitude of the observed differences and to determine the practical significance of the instructional conditions. Students' argumentative writing performances were assessed using the analytic rubric adapted from Zhang (2019), focusing on language use, organization, and content, with all writing samples independently evaluated by three experienced raters to enhance scoring reliability. Data generated from the semi-structured interviews were interpreted using a thematic analytical approach informed by Braun and Clarke's (2006) procedures to explore learners' perceptions,

collaborative experiences, and higher-order thinking development throughout the writing process.

Results

This section presents the findings in relation to the research questions concerning the effects of collaborative writing on students' writing quality and higher-order thinking skills across group, pair, and individual writing conditions.

Writing Quality

Figure 4 presents the mean scores of students' writing quality across the three instructional conditions: group writing, pair writing, and individual writing. Students in the group-writing condition obtained the highest mean score (M = 11.39), followed by those in the pair-writing condition (M = 10.31) and the individual-writing condition (M = 9.16).

A repeated-measures ANOVA revealed a statistically significant effect of instructional condition on writing quality, $F(2, 128) = 24.67$, $p < .001$, $\eta^2 = .28$. Post hoc comparisons using Bonferroni adjustment showed that the group-writing condition produced significantly higher scores than the pair-writing condition ($p = .012$) and the individual-writing condition ($p < .001$). In addition, the pair-writing condition yielded significantly higher scores than the individual-writing condition ($p = .031$).

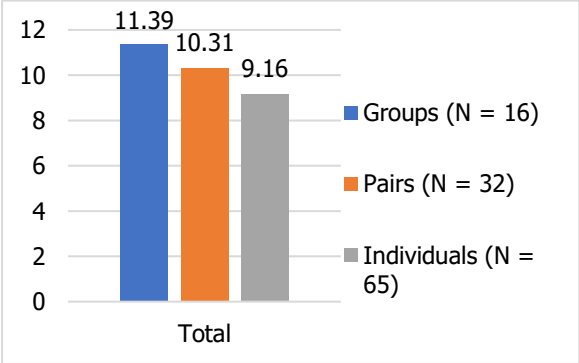

Figure 4. Writing Quality Mean Scores of this Study

Higher-Order Thinking Skills in Group Writing

Table 3 presents the levels of higher-order thinking skills reported by students in the group-writing condition. The overall mean score was 4.54, indicating a very high level of higher-order thinking. Among the three dimensions, analyzing obtained the highest mean score (M = 4.83), followed by creating (M = 4.46) and evaluating (M = 4.32).

Within the creating dimension, the highest mean score was observed for gathering information and constructing a paragraph based on group members' suggestions (M = 4.64), whereas generating new sentences based on peers' contributions obtained a mean score of 4.28. In the evaluating dimension, making choices and evaluating sentence relevance achieved a mean score of 4.38, while selecting appropriate ideas generated during brainstorming yielded a mean score of 4.26. In the analyzing dimension, classifying ideas into categories such as arguments and supporting information received the highest mean score (M = 4.89), followed by separating information into components such as arguments, evidence, thesis statements, and justifications (M = 4.76).

Table 3.
Writing Quality Mean Scores in Group Writing Activities

No.	Statements	Mean	Meaning
	Creating		
1	Generating new sentences based on the knowledge gained from the participants.	4.28	Very high
2	Gathering all the data and creating a paragraph based on the members' suggestions.	4.64	Very high
	Total	4.46	Very high
	Evaluating		
3	Making choices and evaluating the sentences that were related to or unrelated to the subject.	4.38	Very high
4	Choosing appropriate ideas that the members brainstormed.	4.26	Very high
	Total	4.32	Very high
	Analyzing		
5	Separating data into components, such as arguments, proof, thesis statements, and justifications, in order to investigate a deeper comprehension.	4.76	Very high
6	Classifying members' ideas into categories like arguments and supporting information.	4.89	Very high
	Total	4.83	Very high
	Overall Total	4.54	Very high

Higher-Order Thinking Skills in Pair Writing

Table 4 presents students' levels of higher-order thinking skills in the pair-writing condition. The overall mean score was 3.58, corresponding to a high level. Among the three dimensions, analyzing obtained the highest mean score (M = 3.77), followed by creating (M = 3.51) and evaluating (M = 3.46). Within the creating dimension, generating new sentences based on peers' contributions obtained a mean score of 3.57, whereas gathering information and constructing a paragraph based on shared suggestions yielded a mean score of 3.44. In the evaluating dimension, choosing appropriate ideas generated during brainstorming received a mean score of 3.59, while evaluating sentence relevance obtained a mean score of 3.32. In the analyzing dimension, classifying ideas into arguments and supporting information produced the highest mean score (M = 3.83), followed by separating information into components such as arguments and justifications (M = 3.71).

Table 4
The Degrees of Higher-Order Thinking Skills Applied in Pair Writing

No.	Statements	Mean	Meaning
	Creating		
1	Generating new sentences based on the knowledge gained from the participants.	3.57	High
2	Gathering all the data and creating a paragraph based on the members' suggestions.	3.44	High
	Total	3.51	High

Table 4 (cont.)

	Evaluating		
3	Making choices and evaluating the sentences that were related to or unrelated to the subject.	3.32	Moderate
4	Choosing appropriate ideas that the members brainstormed.	3.59	High
	Total	3.46	High
	Analyzing		
5	Separating data into components, such as arguments, proof, thesis statements, and justifications, in order to investigate a deeper comprehension.	3.71	High
6	Classifying members' ideas into categories like arguments and supporting information.	3.83	High
	Total	3.77	High
	Overall	3.58	High

Higher-Order Thinking Skills in Individual Writing

Table 5 presents students' levels of higher-order thinking skills in the individual-writing condition. The overall mean score was 3.16, corresponding to a moderate level. Among the three dimensions, analyzing obtained the highest mean score (M = 3.39), followed by evaluating (M = 3.12) and creating (M = 2.98).

Table 5
The Degrees of Higher-Order Thinking Skills Applied in Individual Writing

No.	Statements	Mean	Meaning
	Creating		
1	Generating new sentences based on the knowledge gained from the participants.	3.05	Moderate
2	Gathering all the data and creating a paragraph based on the members' suggestions.	2.91	Moderate
	Total	2.98	Moderate
	Evaluating		
3	Making choices and evaluating the sentences that were related to or unrelated to the subject.	3.08	Moderate
4	Choosing appropriate ideas that the members brainstormed.	3.15	Moderate
	Total	3.12	Moderate
	Analyzing		
5	Separating data into components, such as arguments, proof, thesis statements, and justifications, in order to investigate a deeper comprehension.	3.36	Moderate
6	Classifying members' ideas into categories like arguments and supporting information.	3.41	Moderate
	Total	3.39	Moderate
	Overall	3.16	Moderate

Within the creating dimension, generating new sentences based on previously acquired knowledge obtained a mean score of 3.05, whereas gathering information and constructing paragraphs yielded a mean score of 2.91. In the evaluating dimension, choosing appropriate ideas obtained a mean score of 3.15, while evaluating sentence relevance yielded a mean

score of 3.08. In the analyzing dimension, classifying ideas into arguments and supporting information obtained a mean score of 3.41, whereas separating information into components such as arguments and justifications yielded a mean score of 3.36.

Semi-Structured Interview Findings

The semi-structured interviews provided additional information regarding students' experiences during collaborative writing activities. Most participants reported positive perceptions of working in mixed-proficiency groups. Students indicated that collaborative interaction enabled them to exchange ideas, discuss alternative viewpoints, and revise their written work with support from peers.

Several participants stated that interaction with classmates of different proficiency levels increased their confidence and provided opportunities to learn from one another. Some participants also reported that disagreements occasionally occurred during group discussions. Lower-proficiency learners noted that observing and interacting with more proficient peers helped them improve their language use and express their ideas more effectively.

DISCUSSION

The findings indicate that collaborative writing, particularly in group-based configurations, provides a context in which learners engage more actively with higher-order thinking processes than in pair or individual writing conditions. One possible explanation for the superior performance observed in the group-writing condition lies in the diversity of perspectives available during collaborative interaction. Exposure to multiple viewpoints required learners to negotiate meaning, justify arguments, evaluate evidence, and collectively make decisions throughout the writing process. From a sociocultural perspective (Vygotsky, 1987), such interaction may have functioned as cognitive scaffolding that enabled learners to perform beyond their individual capabilities. This interpretation accords with Dobao's (2012) findings, which demonstrated that collaborative groups generated richer opportunities for language-related episodes and knowledge construction than learners working in pairs or individually.

The particularly high performance observed in the analyzing dimension suggests that collaborative writing naturally embeds opportunities for analytical reasoning. Through dialogic interaction, learners continuously compared, organized, and refined ideas while constructing written texts. The prominence of analyzing skills may be attributed to the dynamic exchange of perspectives among group members, which required learners to classify information, justify arguments, and synthesize supporting evidence collaboratively. Such processes are consistent with sociocultural views of learning that emphasize the role of social interaction in cognitive development (Vygotsky, 1987).

The comparatively lower performance observed in pair and individual writing conditions further highlights the importance of interactional diversity in higher-order thinking development. Although pair writing promoted meaningful discussion, it provided fewer opportunities for exposure to alternative viewpoints than group writing. Similarly, learners working individually relied primarily on their existing knowledge, limiting opportunities for reflective dialogue and critical examination of ideas. The interview findings support this interpretation, revealing that collaborative discussion encouraged learners to reconsider assumptions, evaluate alternative perspectives, and develop greater confidence in expressing ideas. These findings are also consistent with McDonough et al. (2014), who demonstrated that interaction during collaborative writing provided learners with opportunities to exchange ideas, negotiate meaning, and jointly develop written content. Moments of disagreement

were often perceived as opportunities for deeper reflection rather than obstacles, suggesting that cognitive conflict may play a productive role in promoting analytical and evaluative thinking.

Overall, these findings imply that collaborative writing functions not only as a language-learning activity but also as a socially mediated cognitive process through which higher-order thinking skills are developed. Higher-order thinking appears to emerge through collective meaning-making, peer scaffolding, and dialogic interaction, supporting the notion of distributed cognition in collaborative learning environments. This finding extends Storch's (2013) argument that collaborative writing promotes shared knowledge construction by suggesting that collaboration may also mediate the development of analytical, evaluative, and creative thinking processes. Pedagogically, the findings suggest that collaborative writing should be viewed as an instructional approach capable of fostering both language development and higher-order thinking. Designing writing tasks that encourage negotiation, reflection, and peer feedback may therefore provide effective opportunities for integrating cognitive development with EFL writing instruction.

Pedagogical Implications

The findings of the present study suggest that collaborative writing should be systematically integrated into EFL writing instruction to promote both writing development and higher-order thinking skills. Group-based writing activities appear particularly effective in encouraging learners to analyze information, evaluate alternative perspectives, and collaboratively construct arguments through sustained interaction and shared decision-making. The findings further highlight the value of heterogeneous grouping, as interaction among learners with varying proficiency levels facilitates peer scaffolding, reflective dialogue, and cognitive engagement. In addition, teachers play a crucial role in designing and facilitating collaborative learning environments that encourage meaningful discussion, critical reflection, and evidence-based reasoning. The qualitative findings also indicate that collaborative writing may reduce learners' anxiety and strengthen their confidence in expressing ideas in academic contexts. Furthermore, integrating collaborative writing with AI-assisted feedback tools may provide additional opportunities for reflective thinking, self-regulated learning, and revision practices. Collectively, these findings suggest that collaborative writing represents a promising pedagogical approach for fostering both academic writing competence and higher-order thinking in contemporary EFL classrooms.

Limitations

The findings of the present study should be interpreted with caution in light of several limitations. The study was conducted with a relatively small sample of English-major students from a single public university in northern Thailand, which may limit the transferability of the findings to other EFL contexts. In addition, the relatively short intervention period and the partial reliance on self-assessment measures may not have fully captured the complexity of higher-order thinking development. The study also focused exclusively on argumentative writing and did not examine the interactional discourse through which collaborative learning processes emerged. Furthermore, the fixed sequence of instructional conditions may have introduced potential practice effects despite efforts to maintain comparable task demands across conditions. Future research should therefore employ larger and more diverse samples, longitudinal designs, multiple measures of cognitive engagement, and discourse-based analyses to provide a more comprehensive understanding of how collaborative writing facilitates higher-order thinking across different writing genres and technology-enhanced learning environments.

Conclusion

The findings indicate that collaborative writing, particularly group-based writing, serves as an effective instructional approach for enhancing both argumentative writing performance and higher-order thinking skills among Thai EFL learners. Students engaged in collaborative writing demonstrated stronger analytical, evaluative, and creative thinking than those in pair or individual writing conditions. The results suggest that collaborative interaction, peer scaffolding, and meaning negotiation facilitated deeper cognitive engagement throughout the writing process, contributing to improvements in idea development, organization, and overall writing quality.

The study contributes to sociocultural perspectives on learning by demonstrating that higher-order thinking development emerges through collaborative knowledge construction and dialogic interaction. The findings suggest that collaborative writing functions not only as a language-learning activity but also as a cognitively distributed process in which learners jointly regulate reasoning, evaluate ideas, and construct arguments. This extends existing research by highlighting the role of collaborative epistemic engagement in promoting cognitive and linguistic development in EFL writing contexts.

Despite these contributions, the findings should be interpreted with caution due to the relatively small sample size and the single-institution context, which may limit their generalizability. Future research should employ larger and more diverse samples, longitudinal designs, and process-oriented approaches, such as discourse analysis, to further examine how interactional dynamics facilitate higher-order thinking development. In addition, investigating collaborative writing in technology-enhanced environments, including digital collaborative platforms and AI-assisted feedback systems, may provide valuable insights into emerging forms of cognitive engagement. As critical thinking, collaboration, and problem-solving become increasingly essential in contemporary education, collaborative writing holds considerable potential as a pedagogical approach for preparing EFL learners to meet the cognitive and communicative demands of academic and professional contexts.

REFERENCES

Abrami, P. C., Bernard, R. M., Borokhovski, E., Waddington, D. I., Wade, A., & Persson, T. (2015). *Strategies for teaching students to think critically: A meta-analysis. Review of Educational Research, 85(*2), 275–314. https://doi.org/10.3102/0034654314551063

Anderson, L. W., & Krathwohl, D. R. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Longman.

Bensley, D. A., & Murtagh, M. P. (2021). Teaching thinking skills in psychology: The critical thinking comparison. *Teaching of Psychology, 48*(1), 35–44.

Bloom, B. S. (1956). *Taxonomy of educational objectives: The classification of educational goals*. Longmans, Green and Co.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Carvalho, D. P., Azevedo, I. C., Cruz, G. K., Mafra, G. A., Rego, A. L., Vitor, A. F., Santos, V. E., & Júnior, M. A. (2017). Strategies used for the promotion of critical thinking in nursing undergraduate education: A systematic review. *Nurse Education Today, 57*, 103–107.

Chen, W., & Yu, S. (2019). Implementing collaborative writing in teacher-centered classroom contexts: Student beliefs and perceptions. *Language Awareness, 28*(4), 247–267. https://doi.org/10.1080/09658416.2019.1675680

Choy, S. C., & Cheah, P. K. (2009). Teacher perceptions of critical thinking among students and its influence on higher education. *International Journal of Teaching and Learning in Higher Education*, *20*(2), 198–206.

Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement,* 20(1), 37–46. https://doi.org/10.1177/001316446002000104

Dobao, A. F. (2012). *Collaborative writing tasks in the L2 classroom: Comparing group, pair, and individual work*. *Journal of Second Language Writing, 21*(1), 40–58. https://doi.org/10.1016/j.jslw.2011.12.002

Davies, M., & Barnett, R. (Eds.). (2015). *The Palgrave handbook of critical thinking in higher education*. Palgrave Macmillan. https://doi.org/10.1057/9781137378057

Facione, P. A. (2023). *Critical thinking: What it is and why it counts* (2023 update). Insight Assessment. https://insightassessment.com/wp-content/uploads/2023/12/Critical-Thinking-What-It-Is-and-Why-It-Counts.pdf

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

Goodsett, M. (2020). *Best practices for teaching and assessing critical thinking in information literacy online learning objects. The Journal of Academic Librarianship, 46*(5), https://doi.org/10.1016/j.acalib.2020.102163

Graham, S., & Harris, K. R. (2018). Evidence-based writing practices: A meta-analysis of existing meta-analyses. In M. Braaksma, K. R. Harris, & R. Fidalgo (Eds.), *Design Principles for Teaching Effective Writing: Theoretical and Empirical Grounded Principles* (Studies in Writing, Vol. 34, pp. 13–37). Brill. https://doi.org/10.1163/9789004270480_003

Graham, S., Harris, K. R., & Santangelo, T. (2015). Research-based writing practices and the Common Core: Meta-analysis and meta-synthesis. *Elementary School Journal, 115*(4), 498–522. https://doi.org/10.1086/681965

Guamanga, M. H., Saiz, C., Rivas, S. F., & Morales Bueno, P. (2025). *Critical thinking and metacognition: Pathways to empathy and psychological well-being*. *Journal of Intelligence, 13*(3), 34. https://doi.org/10.3390/jintelligence13030034

Haase, F. A. (2010). Categories of critical thinking in information management. A study of critical thinking in decision making processes. Nómadas. *Critical Journal of Social and Juridical Sciences, 27*(3).

Huber, C. R., & Kuncel, N. R. (2016). Does college teach critical thinking? A meta-analysis. *Review of Educational Research, 86*(2), 431–468. https://doi.org/10.3102/0034654315605917

John, M. V., & Gabrele, D. C. (2025). College Students' 21st Century Skill and its Impact to their Career Readiness: A Sequential Explanatory Design. *International Journal Interdisciplinary Viewpoints, 1*(6), 681–697. https://doi.org/10.64612/ijiv.v1i6.46.

Kim, Y.-S. G., & Graham, S. (2022). Expanding the Direct and Indirect Effects Model of Writing (DIEW): Reading–writing relations, and dynamic relations as a function of measurement/dimensions of written composition. *Journal of Educational Psychology, 114*(2), 215–238. https://doi.org/10.1037/edu0000564

Kitjaroonchai, N. (2022). The effect of collaborative writing tasks on EFL university students' writing performance. *Human Behavior Development and Society, 23*(3), 20–31.

Kitjaroonchai, N., & Suppasetseree, S. (2021). A case study of ASEAN EFL learners' collaborative writing and small group interaction patterns in google docs. *English Language Teaching, 14*(5), 89–108. https://doi.org/10.5539/elt.v14n5p89

Koo, T. K., & Li, M. Y. (2016). A guideline of selecting and reporting intraclass correlation coefficients for reliability research. Journal of Chiropractic Medicine, 15(2), 155–163. https://doi.org/10.1016/j.jcm.2016.02.012

Lai, E. R. (2011). Critical thinking: A literature review. *Pearson's research reports, 6*(1), 40–41. https://images.pearsonassessments.com/images/tmrs/CriticalThinkingReviewFINAL.pdf

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics, 33*(1), 159–174. https://doi.org/10.2307/2529310

Latifi, S., Noroozi, O., & Talaee, E. (2021). *Peer feedback or peer feedforward? Enhancing students' argumentative peer learning processes and outcomes. British Journal of Educational Technology, 52*(2), 768–784. https://doi.org/10.1111/bjet.13054

Liu, J., & Sihes, A. (2025). Critical thinking in English language teaching in China: Definition, dimensions, and pedagogical implications. *International Journal of Academic Research in Business and Social Sciences, 15*(2), 2222–6990. http://dx.doi.org/10.6007/IJARBSS/v15-i2/24803

Lynda, A. Y. (2023). Exploring teachers' perceptions of critical thinking in English language classroom in higher education: A case of EFL teachers. *Altralang Journal, 5*(3), 271–286. https://doi.org/10.52919/altralang.v5i3.367

McDonough, K., Crawford, W. J., & De Vleeschauwer, J. (2014). *Summary writing in a Thai EFL university context. Journal of Second Language Writing, 24(1)*, 20–32. https://doi.org/10.1016/j.jslw.2014.03.001

McLaughlin, A. C., & McGill, A. E. (2017). Explicitly teaching critical thinking skills in a history course**.** *Science & Education, 26*(1), 93–105.

Moonma, J., & Kaweera, C. (2022). A study of critical thinking skills practice in collaborative writing in EFL context. *Asian Journal of Education and Training, 8*(1), 8–14. https://doi.org/10.20448/edu.v8i1.3656

Moore, T. (2013). Critical thinking: Seven definitions in search of a concept. *Studies in Higher Education, 38*(4), 506–522. https://doi.org/10.1080/03075079.2011.586995

Nguyen, T. H. (2020). Impact of teaching critical thinking tasks for enhancing paragraph writing performance of EFL learners. *International Journal of Education and Practice, 8*(4), 784–803. https://doi.org/10.18488/journal.61.2020.84.784.803

Nguyen, T. N. T., & Oanh, D. T. K. (2025). Cooperative learning and its influences on student engagement. *Cogent Education*, *12*(1), 1–19. https://doi.org/10.1080/2331186X.2025.2513414

Pardede, P. (2024). Collaborative writing in EFL setting : A review. *Journal of English Teaching*,10(1), 92–109. https://doi.org/https://doi.org/10.33541/jet.v10i1.5631

Paul, R., & Elder, L. (2019). *Critical thinking: Tools for taking charge of your learning and your life* (4th ed.). Pearson.

Pham, V. P. H., & Hamid, M. O. (2021). The use of first language in peer interaction during collaborative writing tasks in EFL contexts: Students' perspectives and pedagogical implications. *The Asia-Pacific Education Researcher, 30*(6), 553–563. https://doi.org/10.1007/s40299-021-00573-3

Pujiana, N., Waluyo, U., & Soepriyanti, H. (2025). Assessing critical thinking skills in academic writing: A study of English education students at university of Mataram. *Journal Ilmiah Profesi Pendidikan*. https://doi.org/10.29303/jipp.v10i4.4105

Singh, C. K. S., Gopal, R., Tek, O. E., Masa Singh, T. S., Mostafa, N. A., & Ambar Singh R. K. (2020). ESL teachers' strategies to foster higher-order thinking skills to teach

writing. *Malaysian Journal of Learning and Instruction, 17*(2), 195–226. https://doi.org/10.32890/mjli2020.17.2.7

Shehadeh, A. (2011). Effects and student perceptions of collaborative writing in L2. *Journal of Second Language Writing, 20*(4), 286–305. https://doi.org/10.1016/j.jslw.2011.05.010

Storch, N. (2013). *Collaborative writing in L2 classrooms.* Multilingual Matters. https://doi.org/10.21832/9781847699954

Vygotsky, L. S. (1987). *The collected works of L.S. Vygotsky: Problems of general psychology* (Vol. 1). Plenum Press.

White, R., & Arndt, V. (1991). *Process writing*. Longman.

Zhang, K. (2019). *Developing a rating scale for classroom assessment of the argumentative writing of Chinese EFL college students majoring in English*. University of Leicester. Doctoral dissertation. https://hdl.handle.net/2381/45079