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The Impact of SRSD-Based ChatGPT Use on EFL Students' Writing Anxiet

Elsa[1], Ting-Ting Wu 2□1

Author Affiliations
[1]*National Yunlin University of Science and Technology, Douliu 64002, Taiwan*

Author Emails
Corresponding author: ttwu@yuntech.edu.tw

Abstract. This study explores the effect of structured versus unstructured use of ChatGPT on writing anxiety among learners of English as a foreign language (EFL). Although AI tools like ChatGPT are becoming more prevalent in language classrooms, their ability to reduce learners' anxiety remains unclear, particularly when implemented without instructional support. To address this gap, the study employed a quasi-experimental design involving 62 students from two intact EFL classes. One group used ChatGPT with guidance based on the Self-Regulated Strategy Development (SRSD) model, while the other used it without structured support. Writing anxiety was measured before and after the intervention, and analysis of covariance (ANCOVA) was used to compare post-test scores while controlling for pre-test levels. The results revealed a statistically significant difference between the two groups ($p < .01$, partial $\eta^2 = .144$), indicating that the SRSD-based use of ChatGPT more effectively reduced students' writing anxiety. These findings highlight the importance of embedding pedagogical frameworks into AI-assisted language learning to support students' emotional and cognitive needs.

Keywords*:* ChatGPT; SRSD; Writing anxiety; EFL instruction; GAI

INTRODUCTION

In recent years, artificial intelligence (AI) has gained increasing prominence in education, particularly through tools like ChatGPT, which represent the latest stage in a two-decade trajectory of AI evolution that has transformed educational practices from basic automation to intelligent, adaptive systems (Kavitha & Joshith, 2024). As a natural language processing model developed by OpenAI, ChatGPT has rapidly become integrated into various aspects of language learning, offering instant feedback, language modeling, and writing assistance (Asadi et al., 2025). In the context of English as a Foreign Language (EFL) instruction, ChatGPT presents an appealing supplement to traditional teaching methods by supporting students in generating ideas, organizing their writing, and improving linguistic accuracy (Tseng & Lin, 2024). However, while the use of AI in education is growing, the pedagogical implications of such tools remain underexplored, especially with regard to their emotional and psychological impact on learners (Zong & Yang, 2025).

One of the persistent challenges faced by EFL learners is writing anxiety, an affective filter that interferes with their ability to express ideas clearly and hinders overall writing performance (Huang et al., 2024). Writing anxiety has been found to negatively impact learners' cognitive functioning, decrease their motivation, and contribute to avoidance behaviors, ultimately hindering their writing performance (Sabti et al., 2019). In EFL contexts, this anxiety can hinder students' performance even when they have sufficient writing knowledge, as it disrupts their confidence and emotional readiness to express ideas effectively (Akaraphattanawong et al., 2024). As a result, even when learners possess adequate knowledge of writing conventions, anxiety can significantly undermine their performance. Addressing writing anxiety is therefore a crucial aspect of effective language instruction, particularly in environments where writing proficiency is a core learning objective.

While ChatGPT has the potential to reduce writing-related stress by offering immediate support, the rapid and easy generation of text through ChatGPT poses risks of overreliance and reduced engagement in the deeper stages of writing (Trust et al., 2023). Without a pedagogical framework, students may rely on AI-generated content passively, limiting opportunities for cognitive engagement and reflection (Alm & Watanabe, 2023). This raises questions about how such tools should be integrated into

QRCBN 62-6861-8367-215
https://proceeding.unnes.ac.id/eltlt

the classroom to ensure not only performance improvement but also the development of learner autonomy and emotional resilience.

In response to these concerns, researchers and educators have begun exploring instructional strategies that scaffold the use of AI tools. One promising strategy is the Self-Regulated Strategy Development (SRSD) model that encompasses guided, situated, and scaffolded instructional practices (Rocha et al., 2024). This strategy senhances students' writing quality, fosters self-regulation, boosts motivation and engagement, and effectively supports diverse learners by combining explicit writing strategies with cognitive, metacognitive, and behavioral supports (McKeown et al., 2023). SRSD has been widely used in writing instruction to support students by promoting goal-setting, self-monitoring, and the use of metacognitive strategies, which enhance students' confidence and sense of control over the writing process (Bal et al., 2025). By combining cognitive and affective support, SRSD enables learners to take control of their writing process, monitor their progress, and build confidence through structured reflection.

Despite the documented success of SRSD in traditional writing instruction, limited research has examined its integration with AI-based tools like ChatGPT. Most existing studies on ChatGPT in education facilitates idea generation, improving fluency, and providing personalized feedback, but its effectiveness is limited by challenges such as students' overreliance, lack of pedagogical integration, and risks of inaccurate or superficial content (Hossain & Al Younus, 2025; Xiao et al., 2025). Consequently, a gap remains in the literature concerning whether and how the structured use of ChatGPT, guided by models like SRSD, can support emotional aspects of writing such as anxiety reduction. There is a need to move beyond the novelty of AI tools and critically assess their pedagogical integration.

This study seeks to address this gap by comparing the effects of structured and unstructured use of ChatGPT on writing anxiety among EFL learners. Specifically, it examines whether incorporating the SRSD model into ChatGPT-assisted writing instruction leads to greater reductions in writing anxiety compared to using ChatGPT without pedagogical guidance. The research is grounded in the premise that while AI can enhance writing support, its effectiveness depends on how it is implemented in the learning process.

The study is guided by the following research question: Does the SRSD-based use of ChatGPT reduce EFL learners' writing anxiety more effectively than general ChatGPT use? Based on existing literature on SRSD and affective learning, the hypothesis is that students who engage with ChatGPT through the SRSD framework will experience significantly lower levels of writing anxiety after the intervention.

The significance of this study lies in its contribution to the growing discourse on AI integration in education. By highlighting the role of structured pedagogical models in AI-assisted learning, the study provides practical insights for educators seeking to optimize technology use in language classrooms. Furthermore, it offers empirical evidence on how instructional design can mediate the emotional experiences of learners, particularly in relation to anxiety, which remains a major barrier to writing success in EFL contexts. The findings have implications for instructional policy, teacher training, and future research on affective factors in AI-enhanced language learning.

METHODS

This study adopted a quasi-experimental design to investigate the impact of structured versus unstructured use of ChatGPT on EFL students' writing anxiety. The participants consisted of 62 undergraduate students majored in English Department at a public university in Indonesia. These students were assigned randomly. One class (n = 32) served as the experimental group and received ChatGPT-assisted writing instruction guided by the Self-Regulated Strategy Development (SRSD) model, while the other class (n = 30) served as the control group and engaged with ChatGPT without SRSD. Participant identities were anonymized, and ethical procedures including informed consent and voluntary participation were observed throughout the study.

To assess students' writing anxiety, the Second Language Writing Anxiety Inventory (SLWAI) developed by Cheng (2017) was employed. This instrument comprises 22 items categorized into three dimensions: cognitive anxiety (e.g., fear of negative evaluation), somatic anxiety (e.g., physiological tension or nervousness), and avoidance behavior (e.g., reluctance to engage in writing). Each item was rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The SLWAI has

QRCBN 62-6861-8367-215
https://proceeding.unnes.ac.id/eltlt

been widely validated and demonstrates strong internal consistency (Cronbach's α = .74), making it a reliable tool for assessing emotional and behavioral components of writing anxiety in EFL contexts. The instrument was administered as both a pre-test and a post-test to capture changes in anxiety over the course of the intervention.

Instructional procedures in the experimental group followed the six stages of the SRSD model (Harris et al., 2008), as presented in Table 1: (1) Develop Background Knowledge, (2) Discuss It, (3) Model It, (4) Memorize It, (5) Support It, and (6) Independent Performance. Each stage was integrated with ChatGPT through the use of targeted prompts and structured interaction. In the initial stage, students used ChatGPT to explore example texts and thematic vocabulary in order to build background knowledge about the writing topic. In the "Discuss It" stage, students worked collaboratively to examine organizational patterns and linguistic features of model texts, supported by ChatGPT responses to queries such as "What are common transition words in argumentative essays?" During the "Model It" stage, the instructor demonstrated the writing process using ChatGPT as a co-constructor of text, modeling prompts like "Can you help rewrite this thesis statement more clearly?" The fourth stage, "Memorize It," encouraged students to internalize key strategy checklists through self-directed practice and ChatGPT-generated quizzes (e.g., "Test me on cohesive devices used in cause-effect essays"). In the "Support It" stage, students composed paragraphs using scaffolding prompts, such as "Ask ChatGPT to check if your topic sentence aligns with your thesis." The final stage, "Independent Performance," required students to complete full drafts independently, using ChatGPT only after engaging in self-assessment. On the other hand, students in the control group completed the same writing tasks but interacted with ChatGPT following the conventional writing process; pre-writing, planning and writing. They were encouraged to use the tool freely for idea generation, vocabulary assistance, grammar checks, and text revision, reflecting a typical unstructured use of generative AI in classroom settings.

Table 1. Integration of SRSD with AI-assisted learning

SRSD Stage	AI Role	Example Prompt
1. Develop Background Knowledge	Source-Based Support	Generate a 300-word synthesis from 3 sources on a given topic.
2. Discuss It	Personalized Feedback	Evaluate an essay's structure and give 3 strengths and 3 suggestions for improvement.
3. Model It	Writing Process Assistance	Transform a rough draft into a well-structured essay.
4. Memorize It	Stimulated Recall Support	Generate 5 recall questions on key strategies and explain the answers.
5. Support It	Writing Scaffolding	Guide brainstorming, outlining, drafting, and revising an essay.
6. Independent Performance	Self-Assessment Support	Analyze and revise an essay for coherence, logic, and persuasiveness with specific suggestions.

Source: Elsa et al. (2026)

As presented in Figure 1, the intervention lasted eight weeks, with both groups participating in a 50-minute session once per week. Students were not allowed to use ChatGPT in the initial writing (Topic 1: The Benefits of Drinking Water Every Day) and final writing (Topic 5: How Recycling Works and Why It Matters). They began composing their essays on Topic 2 (Why Sleep Is Important for Growing Children) in week 2, Topic 3 (How Plants Grow from Seeds) in week 4, and Topic 4 (The Importance of Exercise for Kids) in week 6, assisted by ChatGPT.

Five essay topics were selected based on their relevance to students' everyday experiences and their varying cognitive demands. Topic 1 (The Benefits of Drinking Water Every Day) and Topic 5 (How Recycling Works and Why It Matters) were used for the initial and final writing tasks without ChatGPT to establish baseline performance and assess strategy transfer. During the intervention, students composed essays on Topic 2 (Why Sleep Is Important for Growing Children), Topic 3 (How Plants Grow from Seeds), and Topic 4 (The Importance of Exercise for Kids) with ChatGPT assistance. The topics were arranged progressively from simple to complex, ranging from basic cause-effect explanations to

process-based and argumentative writing, allowing the study to examine how ChatGPT and SRSD support students' writing development across tasks of different difficulty levels.

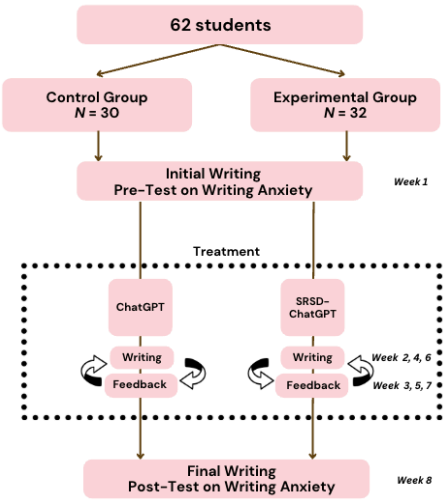

Figure 1. Experimental Procedure

In week 3,5, and 7, students discuss their writings in feedback session. Peer feedback activities were implemented to balance the feedback generated by ChatGPT, acknowledging one of its known limitations as it may provide inaccurate or misleading information. The researcher supervised all sessions to ensure treatment fidelity and provide technical assistance but refrained from offering instructional input that might influence the outcome.

Quantitative data were analyzed using IBM SPSS Statistics (version 28). Descriptive statistics were computed to summarize pre-test and post-test scores for each group. To evaluate the effect of the intervention, an analysis of covariance (ANCOVA) was conducted, with post-test anxiety scores as the dependent variable and pre-test scores as the covariate. All assumptions for ANCOVA were tested.

RESULTS AND DISCUSSION

Results

Descriptive statistics as presented in Table 2 indicated that both groups exhibited comparable levels of writing anxiety prior to the intervention, with the control group (M = 3.08, SD = 0.644) and the experimental group (M = 3.02, SD = 0.655) showing minimal differences at pre-test. However, after the intervention, the experimental group, which received Self-Regulated Strategy Development (SRSD) instruction integrated with ChatGPT, reported a substantial decrease in writing anxiety (M = 2.70, SD = 0.547), whereas the control group, which used ChatGPT primarily for pre-writing, planning, and drafting, exhibited a slight increase in anxiety levels (M = 3.12, SD = 0.628).

The ANCOVA results further confirmed these findings. After controlling for pre-test scores, the covariate remained statistically significant, $F(1, 59) = 11.359$, $p < .01$, $\eta^2 = .161$, indicating that baseline writing anxiety played a meaningful role in predicting post-test outcomes. More importantly, a significant main effect of group was observed, $F(1, 59) = 9.910$, $p < .01$, $\eta^2 = .144$, suggesting that students in the experimental group experienced significantly lower writing anxiety compared to their peers in the control group after the treatment. These results indicate that structured SRSD-based integration of ChatGPT was more effective in reducing writing anxiety than unstructured use.

Table 2. Descriptive statistics for Writing Anxiety

QRCBN 62-6861-8367-215
https://proceeding.unnes.ac.id/eltlt

Group	N	Pre-test		Post-test	
		Mean	SD	Mean	SD
Control group	30	3.08	.644	3.12	0.628
Experimental group	32	3.02	.655	2.70	0.547

Table 3. ANCOVA results for Writing Anxiety

Source	SS	df	Mean Square	F	*p*	Partial η^2
Pre-test (covariate)	3.343	1	3.343	11.359	< .01	.161
Group	2.916	1	2.916	9.910	< .01	.144

Discussion

The present study demonstrates a divergent impact of ChatGPT integration on students' writing anxiety across the two instructional approaches. Students in the control group, who relied on ChatGPT primarily for pre-writing, planning, and drafting, exhibited elevated post-test anxiety scores, whereas those in the experimental group, who received Self-Regulated Strategy Development (SRSD) instruction supported by ChatGPT, reported a significant reduction in writing anxiety. This discrepancy may be attributed to the absence of strategic scaffolding in the control condition. Without explicit guidance on how to regulate their writing processes, control group students were likely confronted with ChatGPT's limitations, as identified in the previous study, including its difficulty in maintaining long-term coherence and deep reasoning, its tendency to promote student passivity, and the blurred boundaries between original work and plagiarism (Yuan et al., 2024).

Additionally, prior research has highlighted several drawbacks of ChatGPT use in educational writing contexts, including students' low metacognitive awareness, ineffective prompting skills, weak argumentative and integrative writing abilities, over-reliance on AI-generated content without critical evaluation, limited digital literacy, and persistent ethical concerns, all of which can hinder its effective integration as a collaborative writing partner (Tarchi et al., 2025). These limitations suggest that ChatGPT alone is insufficient to support students' writing development and may even increase cognitive load, thereby exacerbating writing anxiety.

In contrast, the SRSD interventions typically focus on particular aspects of the writing process, such as planning or revising, by offering clear and structured strategies that are straightforward for students to understand, retain, and apply (Salas et al., 2021). Previous research has shown that SRSD leads to substantial and meaningful enhancements in students' writing knowledge, overall writing quality, writing strategies, and self-regulation skills in L2 contexts (Chen et al., 2022). By strengthening students' metacognitive control and strategic awareness, SRSD enables them to interact with ChatGPT more critically and purposefully rather than relying on it passively.

These findings highlight the necessity of embedding pedagogically grounded AI integration within evidence-based frameworks. When ChatGPT is systematically incorporated into SRSD, it can facilitate emotional regulation and mitigate writing anxiety, whereas unstructured use may unintentionally amplify students' cognitive load and exacerbate their anxiety.

CONCLUSION

This study shows that integrating ChatGPT within a Self-Regulated Strategy Development (SRSD) framework effectively reduces students' writing anxiety, while unstructured use of ChatGPT for pre-writing, planning, and drafting may increase it. The experimental group reported significantly lower post-test anxiety scores than the control group, indicating that explicit strategy instruction combined with ChatGPT enhances self-regulation and supports emotional well-being. These findings highlight the need for guided and pedagogically grounded AI integration to maximize its benefits for L2 writing instruction.

The study provides practical implications for language educators, suggesting that ChatGPT should be implemented as a strategic support tool alongside explicit instruction rather than as a stand-alone writing aid. However, the study is limited by its small sample size, short intervention period, and single-institution context. Future research should examine how different levels of AI scaffolding influence various dimensions of writing anxiety and explore the long-term effects of ChatGPT-assisted SRSD instruction on writing motivation, self-efficacy, and performance across diverse learner populations.

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