Rethinking Language Instruction: Integrating AI Feedback to Develop Critical Writing Skills

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Abstract

This study aimed (1) to develop a task-based language teaching model integrated with generative AI-powered feedback to enhance students' critical writing skills and learning engagement, and (2) to examine the effects of implementing the developed model. Employing a research and development design, the model was constructed through a synthesis of relevant literature and validated by five experts. The developed model was then implemented with 25 Grade 11 students over a seven-week instructional period. Research instruments included an expert interview form, an instructional model evaluation form, lesson plans based on the developed model, and a performance-based critical writing assessment. Quantitative data were analyzed using descriptive statistics (mean and standard deviation) and repeated-measures analysis of variance, followed by post-hoc comparisons. The results indicated that the instructional model was evaluated by experts as highly appropriate and pedagogically coherent. Moreover, students' critical writing skills showed statistically significant improvement across the intervention period, accompanied by increased levels of learning engagement. The findings suggest that integrating task-based instruction with generative AI-powered feedback and engagement-oriented design can effectively enhance critical writing development and learner engagement in secondary language education.

Keywords: Task-Based Language Teaching, AI-Powered Feedback, Gamification, Critical Writing Skills, Learning Engagement

1. Introduction

In an increasingly complex and technology-mediated world, the ability to think critically has become a fundamental educational goal, particularly in language education. Critical thinking enables learners to analyze information, evaluate ideas, and construct reasoned arguments, all of which are essential for academic success and effective participation in contemporary society (Golden, 2023). Within the domain of language learning, critical writing represents a core manifestation of critical thinking, as it requires learners to synthesize information, justify viewpoints, and communicate ideas logically and coherently.

Despite its importance, research has consistently shown that many secondary-level learners encounter difficulties in developing critical writing skills (Petchngam, 2022). These challenges include problems with organizing ideas, constructing coherent arguments, and engaging in

analytical reasoning through writing. Prior studies have noted that writing instruction often emphasizes surface-level language accuracy rather than higher-order thinking and argumentation, resulting in limited opportunities for learners to develop critical perspectives through writing (Dwee et al., 2016; Fahim & Mirzaii, 2014).

One key factor identified for improving writing and critical thinking outcomes is the effective integration of information and communication technology (ICT) into instructional design. Technology-supported learning environments can facilitate interaction, provide access to diverse learning resources, and support formative feedback processes that are essential for writing development. In this context, task-based language teaching (TBLT) has been widely recognized as an instructional approach that promotes meaningful language use through goal-oriented tasks, encouraging learners to engage cognitively and collaboratively in the learning process (Butler, 2011; Wiboolyasarin, 2023).

Recent advances in artificial intelligence have further expanded the potential of technology-enhanced writing instruction. Studies indicate that AI-powered feedback can provide timely, personalized, and actionable responses to learners' written output, supporting iterative revision and deeper engagement with both content and language form (Wiboolyasarin et al., 2024; Wiboolyasarin et al., 2025a). When embedded within task-based and collaborative writing environments, AI-driven feedback has been shown to enhance learner autonomy, metacognitive awareness, and writing performance (Alzubi et al., 2024).

In addition to feedback mechanisms, gamification has emerged as an instructional strategy for enhancing learning engagement. By incorporating elements such as challenges, feedback loops, and progress indicators, gamified learning environments can increase learners' motivation, persistence, and active participation. Empirical studies suggest that gamification is particularly effective when integrated with pedagogically sound instructional approaches, such as task-based learning, rather than applied as an isolated motivational tool (Antonaci et al., 2019; Hanus & Fox, 2015).

Recognizing these pedagogical developments and ongoing challenges in writing instruction, this study proposes the development of a task-based language teaching model integrated with generative AI feedback and gamification. By systematically combining task-based instruction, collaborative writing, AI-powered feedback, and engagement-oriented design, the study aims to provide empirical evidence on the effectiveness of an integrated instructional model in enhancing students' critical writing skills and learning engagement at the secondary education level.

2. Literature review

This study is grounded in theoretical and empirical research on task-based language teaching, critical writing pedagogy, learner engagement, gamification, and AI-supported feedback in writing instruction.

Task-Based Language Teaching and Writing Development

Task-Based Language Teaching (TBLT) has been widely recognized as an effective pedagogical approach that promotes meaningful language use through goal-oriented tasks that resemble real-world communicative situations (Ellis, 2003; Nunan, 2010; Van den Branden, 2006). In writing instruction, TBLT shifts the focus from isolated linguistic forms to purposeful meaning-making, encouraging learners to engage in processes such as planning, drafting,

revising, and reflecting on their written output (Ellis et al., 2019). Empirical studies indicate that task-based writing activities support deeper cognitive processing and foster learner autonomy, particularly when tasks are sequenced and scaffolded appropriately (Butler, 2011).

Despite these advantages, implementing TBLT in writing classrooms presents persistent challenges. Teachers often face constraints related to time, class size, and workload, which limit their ability to provide timely and individualized feedback. These constraints can reduce the effectiveness of task-based writing activities and weaken learner engagement during extended writing cycles (Dwee et al., 2016; Fahim & Mirzaii, 2014). As a result, there is a need for instructional models that enhance the feedback dimension of TBLT while maintaining meaningful learner engagement.

Critical Writing Skills in Language Education

Critical writing is a higher-order cognitive skill that extends beyond grammatical accuracy and textual coherence. It involves the ability to analyze information, evaluate arguments, synthesize multiple perspectives, and articulate reasoned positions supported by evidence (Condon & Kelly-Riley, 2004; Stapleton, 2001). In language education, critical writing is increasingly regarded as essential for academic literacy and lifelong learning, particularly at the secondary and tertiary levels.

However, research consistently shows that learners struggle to develop critical writing skills when instruction emphasizes product-oriented outcomes rather than cognitive and reflective processes. Limited opportunities for iterative revision and insufficient formative feedback further hinder students' ability to engage critically with content and improve their writing quality (Bitchener & Ferris, 2012; Graham et al., 2015). These findings highlight the importance of instructional approaches that integrate structured tasks, reflection, and continuous feedback to support critical writing development.

Generative AI Feedback in Writing Instruction

Recent advances in generative artificial intelligence have introduced new possibilities for feedback provision in language learning. AI-powered feedback systems are capable of delivering immediate, personalized, and scalable responses to learners' written output, addressing both surface-level language accuracy and higher-level aspects such as coherence, organization, and argumentation (Meyer et al., 2024; Zhu et al., 2020). Research indicates that automated and AI-generated feedback can positively influence learners' revision behaviors, metacognitive awareness, and writing quality, particularly when feedback is formative and actionable (Barrot, 2023; Escalante et al., 2023).

Importantly, studies emphasize that AI feedback is most effective when embedded within a clear pedagogical framework rather than used as a standalone tool. When integrated into task-based and collaborative writing environments, AI-generated feedback can support learner autonomy, enhance engagement, and complement teacher feedback without replacing the instructor's role (Wiboolyasarin et al., 2024; Wiboolyasarin et al., 2025a).

While prior research has examined task-based instruction, critical writing, gamification, and AI-powered feedback independently, there remains a need for empirically validated instructional models that systematically integrate these components into a coherent framework. Existing studies rarely address how task-based pedagogy, engagement-oriented design, and generative AI feedback can be aligned across all stages of the writing process.

This study addresses this gap by developing and validating a task-based language teaching model that integrates generative AI feedback and gamification to enhance students' critical writing skills and learning engagement. By grounding the model in established theoretical perspectives and empirically testing its effectiveness, the study contributes both a practical instructional framework and evidence-based insights into AI-supported task-based writing instruction.

3. Methodology

Objective

The primary purpose was to design and implement the TBLT model integrated with generative AI-powered feedback aimed at enhancing secondary school students' critical writing skills and learning engagement. The research process was conducted in two sequential phases**:** (1) model development and (2) model implementation and effect investigation

Participants

Two participant groups were involved in this study.

The expert group consisted of five specialists**,** including three experts in Thai language education and two experts in educational technology and communications. This group participated in the model review and validation process during the development and finalization phases.

The experimental group comprised 25 Grade 11 students enrolled at a university demonstration school in Thailand. These students participated in a seven-week instructional intervention using the developed task-based teaching model. The group was selected through purposive sampling, as they were enrolled in a Thai language course focusing on writing development.

Research Instruments

Multiple research instruments were employed across the two phases of the study:

1. **Expert Interview Form**

Used in Phase 1 to collect qualitative insights from experts regarding theoretical alignment, instructional coherence, and feasibility of the proposed model.

2. **Instructional Model Evaluation Form**

A structured evaluation form employing a five-point Likert scale was used by experts in Phases 1 and 3 to assess the appropriateness, clarity, instructional alignment, and applicability of the developed model.

3. **Lesson Plans Based on the Developed Model**

Seven lesson plans were designed in accordance with the task-based teaching framework, integrating collaborative writing tasks, gamification elements, and generative AI feedback.

4. **Critical Writing Skills Assessment**

A performance-based writing assessment was used to measure students' critical writing skills at three time points: pre-test, mid-test, and post-test.

Research Procedures

Phase 1 Development of the Teaching Model

A comprehensive review and synthesis of literature related to task-based language teaching, collaborative writing, gamification, AI-generated feedback, critical writing, and learning engagement were conducted. Based on this synthesis, a preliminary instructional model was designed. The draft model was then submitted to the expert panel for evaluation and feedback. Revisions were made iteratively based on expert comments to ensure theoretical soundness and practical feasibility.

Phase 2 Implementation and Effect Investigation

The revised model was implemented over seven consecutive weeks with the experimental group. Instruction followed the three core stages of task-based learning: pre-task, task performance, and post-task. Students engaged in individual and collaborative writing tasks, received generative AI feedback on their drafts, revised their work accordingly, and reflected on their learning process. Critical writing skill assessments and engagement measures were administered at pre-, mid-, and post-intervention stages.

Data Analysis

Quantitative data obtained from expert evaluations, writing assessments, and engagement measures were analyzed using mean scores and standard deviations to determine overall trends and levels of appropriateness. To examine the effects of the instructional model on students' critical writing skills and learning engagement over time, repeated-measures analysis of variance (ANOVA) was employed, followed by post-hoc comparisons where appropriate.

Qualitative data from expert comments and classroom observations were analyzed using content analysis and were used to support the interpretation of quantitative findings and to guide model refinement.

4. Results

This study addressed two research objectives: (1) to develop a task-based language teaching model integrated with generative AI feedback and (2) to examine the effects of implementing the model on students' critical writing skills. The results are presented in three phases corresponding to these objectives.

Phase 1 Development of the Teaching Model

The development of the instructional model was based on a systematic analysis and synthesis of theories and prior research related to task-based language teaching, collaborative writing, gamification, generative AI feedback, critical writing skills, and learning engagement. The synthesized findings were used to construct a preliminary teaching model.

The developed model consists of seven core components: (1) writing tasks, (2) generative artificial intelligence, (3) feedback, (4) gamification, (5) teacher, (6) student, and (7) assessment. The instructional process follows three main task-based stages: pre-task, task performance, and post-task.

- The pre-task stage focuses on introducing learning objectives, critical writing structure, collaborative processes, and weekly task goals.

- The task performance stage emphasizes collaborative planning, joint outlining, individual drafting, and the use of AI-generated feedback during writing.
- The post-task stage involves revision, reflection, peer discussion, and improvement of written work.

Expert review indicated that the model is logically structured, theoretically grounded, and aligned with key competencies for 21st-century learning, including critical thinking, collaboration, digital literacy, and lifelong learning. Experts also highlighted the model's flexibility and potential for application in diverse instructional contexts.

Phase 2: Implementation and Effect Investigation

Critical Writing Skills

Students' critical writing skills were assessed at three time points: pre-test, mid-test, and post-test. Descriptive statistics revealed a continuous increase in mean scores across the three stages. Mean scores increased from 13.26 (SD = 3.59) at pre-test to 17.38 (SD = 1.39) at mid-test, and further to 18.00 (SD = 0.98) at post-test.

Repeated-measures ANOVA indicated a statistically significant difference in critical writing scores across time **(**$F = 48.290$, $p < .001$), with a large effect size (Partial $\eta^2 = .668$). Trend analysis showed a significant linear increase, confirming consistent improvement in students' critical writing performance throughout the intervention. Pairwise comparisons using the Bonferroni method demonstrated that post-test scores were significantly higher than both pre-test and mid-test scores.

5. Discussion

This study aimed to develop and examine a task-based language teaching model integrated with generative AI feedback to enhance students' critical writing skills and learning engagement. The discussion is organized into two parts.

The findings from Phase 1 indicate that the developed instructional model is theoretically grounded, pedagogically coherent, and practically feasible. The model's structure, comprising seven core components and three task-based stages, reflects a systematic integration of task-based language teaching, collaborative writing, gamification, and generative AI feedback. This design aligns closely with established principles of task-based language teaching, which emphasize meaningful tasks, learner engagement, and the use of language as a tool for communication and problem-solving (Butler, 2011; Wiboolyasarin, 2023).

The clear sequencing of pre-task, task performance, and post-task stages supports learners' gradual engagement with critical writing processes. By explicitly scaffolding planning, drafting, feedback reception, revision, and reflection, the model addresses a well-documented limitation of traditional writing instruction, namely the lack of structured opportunities for iterative writing and reflection. Prior research suggests that writing development is most effective when learners are supported through multiple cycles of revision accompanied by formative feedback (Sperber et al., 2025; Zhu et al., 2020). The present model operationalizes this principle by embedding feedback and reflection systematically within each task cycle.

The integration of generative AI feedback at the drafting and revision stages further strengthens the instructional design. AI-generated feedback provides learners with immediate and individualized guidance, enabling them to identify weaknesses, refine arguments, and

improve textual coherence in a timely manner. This finding is consistent with recent studies demonstrating that AI-supported feedback can enhance learners' revision behaviors and metacognitive engagement when aligned with clear pedagogical goals (Ahmad et al., 2025; Wiboolyasarin et al., 2025a).

In addition, the inclusion of gamification elements, such as points, badges, and progress indicators, plays a supportive role in sustaining learner motivation and participation. Importantly, these elements are embedded within meaningful task-based activities rather than functioning as extrinsic rewards alone. Expert validation confirmed that this integration enhances engagement while maintaining instructional rigor, echoing prior findings that gamification is most effective when aligned with learning objectives and authentic tasks (Calma et al., 2022).

The results from Phase 2 demonstrate that implementing the developed model had a positive and statistically significant impact on students' critical writing skills and learning engagement. The steady improvement observed across pre-, mid-, and post-intervention assessments indicates that the task-based, feedback-rich learning environment effectively supported the development of higher-order writing skills. The large effect size further suggests that these gains were strongly associated with the instructional intervention rather than occurring by chance. (Chouang et al., 2020)

A key factor contributing to these outcomes is the role of generative AI feedback in supporting iterative revision. The findings show that students actively engaged with AI-generated feedback by analyzing suggestions and applying them to revise their writing. This process appears to have fostered metacognitive awareness and self-regulation, as learners became more conscious of their reasoning, structure, and language use. These findings are consistent with research indicating that AI-supported feedback can promote deeper learning when learners are required to reflect on and act upon feedback rather than passively receiving it (Ahmad et al., 2025; Sperber et al., 2025).

Rather than replacing the teacher's role, AI feedback in this study functioned as a formative scaffold that complemented teacher guidance and peer interaction. This supports previous research emphasizing the importance of human-centered approaches to AI integration, where technology enhances instructional capacity while preserving the teacher's pedagogical role (Wiboolyasarin et al., 2024; Wiboolyasarin et al., 2025a).

6. Conclusion

This study developed and examined a task-based language teaching model integrated with generative AI feedback to enhance students' critical writing skills and learning engagement. Using a research and development design, the study demonstrated that the proposed model is theoretically grounded, pedagogically coherent, and empirically effective for secondary-level language instruction. The findings confirm that the integration of task-based instruction, collaborative writing, generative AI feedback, and gamification can create a structured yet flexible learning environment that supports critical writing development. The model's three-stage process, i.e., pre-task, task performance, and post-task, provides systematic scaffolding that enables learners to plan, draft, revise, and reflect on their writing in a meaningful and iterative manner. Expert validation further affirmed the model's alignment with principles of active learning, higher-order thinking, and 21st-century competencies.

Empirical results from the implementation phase revealed significant improvements in students' critical writing skills, with large effect sizes across pre-, mid-, and post-intervention assessments. In addition, students' learning engagement increased substantially, reflecting sustained behavioral, cognitive, and affective involvement throughout the instructional process. These outcomes highlight the role of generative AI feedback as a formative learning scaffold that supports revision, metacognitive awareness, and learner autonomy, while complementing teacher guidance and peer collaboration.

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