



## Exploring the Synergistic Effects of AI-Assisted Peer Feedback and E-Portfolios on EFL Learners' Reflective Thinking and Feedback Literacy in Process-Oriented Writing

Nguyen Thi Kim Ba

University of Finance - Marketing, Ho Chi Minh City, Vietnam

\* Corresponding Author: **Nguyen Thi Kim Ba**

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### Abstract

This study aims to investigate the synergistic effects of AI-assisted peer feedback and e-portfolios on English as a Foreign Language (EFL) learners' reflective thinking and feedback literacy in process-oriented writing. Feedback is a crucial instructional intervention for improving L2 writing skills, yet traditional teacher feedback faces significant challenges, particularly in large classes where providing timely and personalized responses is impractical and contributes to teacher workload and fatigue. Peer assessment has emerged as an important pedagogical strategy to address these issues, fostering critical thinking, collaboration, and improving writing performance. This study seeks to provide valuable empirical and experiential insights, offering practical implications for educators to optimize technology-enhanced writing pedagogy in EFL settings, foster student autonomy, and promote sustainable feedback practices.

**Keywords:** AI, AI-Assisted Peer Feedback, E-Portfolios, Feedback Literacy

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### 1. Introduction

Effective feedback is fundamental to the development of English as a Foreign Language (EFL) writing skills. However, the traditional model of teacher-provided feedback faces significant challenges, particularly in large classes, where offering timely and personalized guidance is often impractical and can lead to teacher fatigue. Peer feedback has emerged as a valuable pedagogical strategy to address these issues, as it encourages critical thinking, argumentation skills, student interaction, and collaboration, ultimately improving writing performance in process-oriented L2 writing (Yu *et al.*, 2021; Cao *et al.*, 2019)<sup>[18, 4]</sup>. During peer review, learners assume dual roles as both feedback receivers and active reviewers, contributing to a shared learning community. Nevertheless, peer feedback effectiveness is often hampered by students' difficulties in providing high-quality comments, focusing too heavily on surface-level errors, and concerns regarding their own linguistic proficiency or the usefulness of their feedback. This highlights a persistent need for strategies to enhance students' peer feedback skills (Kerman *et al.*, 2023)<sup>[7]</sup>.

In response to these challenges, the rapid advancement of Artificial Intelligence (AI) technology, particularly Large Language Models (LLMs) like ChatGPT, presents a promising avenue for augmenting writing instruction and feedback. AI-supported approaches have shown potential in enhancing the quality of peer feedback and improving the writing ability of feedback providers (El Alaoui, 2023)<sup>[5]</sup>. Concurrently, e-portfolios have gained prominence as powerful tools in process-oriented writing, valued for their ability to foster self-assessment, self-reflection, and critical thinking. They provide a clear representation of student growth and development over time (Baturay, & Daloğlu, 2010)<sup>[3]</sup>. While both AI-assisted feedback and e-portfolios individually offer significant benefits, there remains a limited body of empirical research specifically investigating their combined, synergistic effects on EFL learners' reflective thinking and feedback literacy within a process-oriented writing framework. Previous studies often call for more qualitative and mixed-methods designs to deeply understand student engagement and experiences with such technology-enhanced learning approaches in authentic classroom contexts (Irgin & Bilki, 2024)<sup>[8]</sup>.

## 2. The Crucial Role of Feedback in Process-Oriented L2/EFL Writing

Feedback is an indispensable instructional intervention for enhancing learner performance, particularly in second and foreign language (L2) writing development. In English as a Foreign Language (EFL) writing classrooms, learners require facilitative feedback to improve their language production skills. Traditional L2 writing settings, however, often rely on teachers as the primary source of feedback, which becomes impractical in large classes for providing timely, personalized, and constructive comments (Sultana *et al.* 2020) <sup>[9]</sup>. Teachers frequently experience fatigue from repetitive essay correction, and feedback may sometimes be overly general, limiting its helpfulness (Bai *et al.*, 2021) <sup>[7]</sup>. This challenge has spurred a shift in writing pedagogy from product-oriented to process-oriented writing, which emphasizes iterative cycles of planning, drafting, and revising. Within this framework, peer assessment has emerged as a vital pedagogical strategy where students evaluate and provide feedback on each other's work (Li *et al.*, 2020). This approach not only alleviates the teacher's burden but also cultivates critical thinking and argumentation skills, encourages student interaction and collaboration, and improves writing performance. Peer feedback sessions are particularly essential in process-oriented writing as they promote negotiation and collaborative learning among L2 writers, engaging learners in dual roles as both feedback receivers and reviewers within a learning community. In this peer feedback culture, students are considered "feedback creators," actively responsible for providing feedback and self-assessing their work (Patchan & Schunn, 2015) <sup>[13]</sup>.

## 3. Challenges and Nuances of Peer Feedback

Despite its recognized benefits, the effectiveness of peer assessment is highly contingent on the quality of the feedback provided by peers. High-quality, constructive, specific, and actionable feedback enhances recipients' engagement and promotes meaningful revisions. Conversely, unclear feedback, or comments containing negative emotional responses, can hinder effective utilization (Kerman *et al.*, 2022; Patchan *et al.*, 2016) <sup>[15]</sup>. Studies show that providing high-quality peer feedback is associated with improved writing abilities, enhanced awareness of writing genres, and increased reflective and critical thinking among student reviewers. This is because giving feedback engages students in critical analyses and reflections, requiring them to identify problems, contemplate solutions, and offer revision suggestions, which proves beneficial when they revise their own essays (Yu, 2019) <sup>[17]</sup>.

However, students often face significant challenges in providing meaningful feedback. These difficulties stem from a lack of specific genre knowledge, concerns about their own linguistic proficiency, uncertainties regarding the usefulness and accuracy of their feedback, and apprehension about peers' emotional reactions to critical comments. Untrained EFL students, for instance, tend to focus disproportionately on surface-level errors (e.g., grammar, vocabulary, punctuation) rather than addressing global issues like content and organization (Kerman *et al.*, 2023) <sup>[7]</sup>. Research has also revealed inconsistencies and lower validity and reliability of peer feedback compared to expert evaluations, underscoring

a pressing need for interventions to enhance students' peer feedback skills. Additionally, cultural contexts, such as the Turkish context, where learners are accustomed to teacher-centered feedback, may lead to limited exposure to process-oriented strategies like peer learning and acting on feedback (Bai *et al.*, 2021) <sup>[7]</sup>.

## 4. The Rise of Technology and AI in Feedback Provision

The increasing availability of technology in L2 classrooms has created diverse opportunities for L2 writers to promote their writing and facilitate feedback exchange. Online interactive platforms, such as student blogs and WeChat, have significantly streamlined online peer interaction, enabling the seamless exchange of written works and feedback. Research on online peer feedback has shown positive outcomes, including more effective revisions at both local and global levels, enhanced overall writing quality, development of critical thinking skills, and a supportive learning atmosphere (Liou & Peng, 2009; Ma, 2020) <sup>[11, 14]</sup>. However, some studies have noted inconsistent positive outcomes, with potential for frustration and misunderstandings due to the absence of non-verbal cues in online communication.

More recently, the emergence of Artificial Intelligence (AI) technology, particularly large language models (LLMs) like ChatGPT, has introduced a transformative element to language education. AI tools are increasingly recognized as valuable resources for augmenting writing instruction and feedback, assisting with tasks such as outline preparation, content revision, proofreading, post-writing reflections, and providing timely and high-quality feedback (Little *et al.*, 2023) <sup>[12]</sup>. Empirical evidence suggests that LLM-generated feedback can significantly increase revision performance, boost task motivation, and elicit positive emotions compared to receiving no feedback.

AI's potential extends to monitoring and enhancing students' peer feedback generation. Studies outside EFL writing have demonstrated that AI-powered tools, such as Review-writer and Autograder, can improve the quality of student-generated feedback by guiding students, pinpointing potential issues, and prompting revisions. For instance, a study by Guo *et al.* (2024) integrated an AI chatbot named Eva into an online peer review system to assist EFL students in generating feedback (Bai *et al.*, 2021) <sup>[7]</sup>. Their findings revealed that this AI-supported approach significantly enhanced students' feedback quality and improved the writing ability of feedback providers. This iterative process involved students providing feedback, the AI tool assessing their comments and offering suggestions, and students revising their feedback accordingly. This suggests that AI can make learners more attentive during review, leading to more meaningful, comprehensive, and clear feedback with specific recommendations (Kerman *et al.*, 2022) <sup>[6]</sup>.

Despite these advancements, existing research has predominantly focused on the design and validation of AI algorithms and models. There is limited empirical study in EFL writing research investigating whether AI-supported peer feedback positively impacts the development of learners' feedback literacy and student reviewers' writing ability. Furthermore, ethical considerations regarding academic integrity and potential over-reliance on technology are

ongoing concerns that require teachers to provide guidance on the ethical and effective use of AI. Research is needed to explore the specific role of AI in supporting the provision of peer feedback, rather than merely evaluating final products (Rudolph *et al.*, 2023) <sup>[16]</sup>.

### 5. E-Portfolios in L2 Writing: Fostering Self-Assessment and Reflection

The shift towards learner-centered education has strengthened the rationale for alternative assessment techniques, with portfolios gaining significant prominence. A portfolio is a “purposeful, selective collection of learner work and reflective self-assessment that is used to document progress and achievement over time with regard to specific criteria”. With technological advancements, traditional portfolios have evolved into electronic portfolios (e-portfolios) or digital portfolios, utilizing platforms such as blogs, wikis, Google Docs, and Google Drive (Barrett, 2005) <sup>[2]</sup>.

E-portfolios are highly valued for their ability to promote a wide range of learning benefits. They empower learners to take responsibility for their own learning, facilitate collaboration between peers and teachers, and connect theoretical knowledge with practical application. More profoundly, e-portfolios are recognized as powerful tools for enhancing critical thinking, problem-solving abilities, self-assessment, self-reflection, and self-regulation in writing. They provide a clear visual representation of student growth and can contribute to the co-construction of knowledge and the establishment of vibrant learning communities. For instance, Irgin and Bilki (2024) <sup>[8]</sup> found that student blogs used for online peer evaluation in an L2 writing course improved students' ability to perceive and use feedback effectively, enhanced critical thinking skills, and built a writing community. Similarly, Bozorgian *et al.* (2024) explored Google Drive e-portfolios for teacher and peer feedback, noting their role in documenting progress and fostering confidence. E-portfolios, by their nature, support process-oriented writing, allowing students to reflect on both the texts they compose and the writing process itself.

### 6. Conclusion

This study embarked on exploring the multifaceted and synergistic effects of AI-assisted peer feedback and e-portfolios on EFL learners' reflective thinking and feedback literacy within a process-oriented writing framework. The synthesis of existing literature underscores the transformative potential of integrating these technological and pedagogical approaches to address long-standing challenges in EFL writing instruction. In short, the integration of AI-assisted peer feedback and e-portfolios presents a robust framework for enhancing EFL learners' writing development. By leveraging AI's capacity for timely and high-quality feedback and e-portfolios' ability to foster sustained reflection and documentation, this synergistic approach can cultivate improved feedback literacy and deeper reflective thinking in process-oriented writing. Continued research, particularly longitudinal and mixed method designs in diverse contexts, will be essential to fully realize and optimize this transformative potential in language education.

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