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Effects of Traditional and AI-Assisted Writing Feedback on L2 Writing Self-Efficacy

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Abstract

Writing self-efficacy is a pivotal motivational construct that exerts profound influence on second language (L2) learners' writing engagement, persistence, and long-term academic performance. Writing feedback, as a core pedagogical intervention, serves as a primary external source shaping learners' self-efficacy beliefs. Over the past decades, feedback practices in L2 writing have evolved from conventional teacher-centered modes to multi-agent models incorporating peer, self, and artificial intelligence (AI)-assisted feedback. This study systematically reviews theoretical frameworks, empirical findings, mediating mechanisms, and moderating factors concerning how traditional and AI-assisted feedback influence L2 writing self-efficacy. Drawing on a comprehensive analysis of domestic and international research, the review demonstrates that teacher feedback strengthens both cognitive and affective dimensions of self-efficacy, peer feedback fosters vicarious learning and emotional comfort, self-feedback enhances regulatory confidence, and AI-assisted feedback uniquely boosts learners' beliefs through immediacy, personalization, and affective interaction. Mediators including flow experience, writing anxiety, and academic buoyancy are identified, alongside moderators such as learner proficiency, feedback frequency, and feedback specificity. The review further discusses critical research gaps regarding long-term effect sustainability, the complexity of AI feedback mechanisms, contextual diversity, and methodological limitations. Directions for future research are proposed to advance the field's understanding of feedback efficacy and inform evidence-based L2 writing pedagogy.

Keywords

L2 Writing; Writing Feedback; Writing Self-Efficacy; AI-Assisted Feedback; Mediating Mechanisms

1. Introduction

Writing self-efficacy, defined as learners' subjective judgments of their capacity to accomplish writing tasks successfully (Bandura, 1977), has been widely recognized as a central motivational variable in L2 writing research. It not only influences learners' initial task choice and effort expenditure but also determines their persistence in the face of writing difficulties, ultimately shaping long-term writing development and academic outcomes (Bandura, 1997). Writing feedback, as a critical instructional tool in L2 writing classrooms, directly activates the four foundational sources of self-efficacy proposed by Bandura: mastery experience, vicarious experience, social persuasion, and emotional state. Through corrective guidance, evaluative comments, and affective support, feedback conveys information about learners' performance and potential, thereby modifying their confidence beliefs and motivational orientations.

Over recent years, rapid advancements in educational technology, particularly the emergence of generative AI tools such as ChatGPT, have transformed the landscape of writing feedback delivery. Traditional feedback practices, once dominated by teacher comments, have expanded to include peer feedback, guided self-feedback, and AI-assisted feedback, creating diverse and hybrid feedback ecosystems (Lund et al., 2023; Yan, 2023). While these new models offer unique advantages such as real-time response, individualized correction, and non-judgmental interaction, their specific effects on L2 writing self-efficacy remain understudied.

Extant literature on writing feedback and self-efficacy often focuses on either traditional feedback forms or emerging AI-assisted feedback in isolation, lacking a comprehensive synthesis that compares and contrasts their mechanisms and outcomes. Additionally, most empirical investigations adopt short-term cross-sectional designs, limiting understanding of the long-term sustainability of feedback-induced self-efficacy gains. Few studies systematically examine the mediating psychological processes and moderating contextual factors that shape feedback efficacy across different learner populations. To address these gaps, this systematic review synthesizes theoretical foundations, empirical evidence, mediating pathways, and moderating factors of traditional and AI-assisted feedback on L2 writing self-efficacy, aiming to provide a holistic framework for understanding feedback efficacy and offer evidence-based implications for optimizing L2 writing instruction.

2. Theoretical Basis

The relationship between writing feedback and L2 writing self-efficacy is rooted in several key theoretical frameworks that collectively explain how feedback shapes learners' confidence beliefs and motivational behaviors.

Bandura's (1977) social cognitive theory provides the foundational lens for understanding writing self-efficacy and feedback effects. According to the theory, self-efficacy is not a static trait but a dynamic belief system shaped by four primary sources of information. Mastery experience, derived from successful task completion, is the most powerful predictor of self-efficacy, as direct evidence of progress reinforces learners' confidence in their abilities. Vicarious experience, gained through observing peers' performance, allows learners to form beliefs about their own potential by comparing themselves to others. Social persuasion, including verbal encouragement, evaluative feedback, and peer support, conveys external judgments of competence that can either strengthen or weaken self-efficacy. Finally, emotional states such as anxiety, frustration, or satisfaction during task performance influence how learners interpret their experiences, with positive emotions enhancing confidence and negative emotions undermining it. Writing feedback directly activates all four sources: corrective comments that help learners improve their writing foster mastery experience; peer feedback that reveals others' strengths and weaknesses provides vicarious learning opportunities; encouraging or critical feedback serves as social persuasion; and supportive, low-pressure feedback environments reduce anxiety, improving learners' emotional states (Bandura, 1997). This framework has guided numerous studies on L2 writing feedback and self-efficacy, particularly in the Chinese EFL context (Tang & Xu, 2011; Li, 2014).

Pekrun's (2006) control-value theory complements social cognitive theory by emphasizing the role of perceived task control and value in shaping academic emotions and self-efficacy. According to the theory, learners' confidence in their ability to influence task outcomes (perceived control) and their perceived importance of the task (perceived value) jointly determine their emotional responses to learning activities. Feedback that is timely, specific, and actionable enhances learners' sense of control by reducing uncertainty about their performance and clarifying pathways for improvement, thereby fostering positive emotions and strengthening self-efficacy. This framework is particularly relevant to AI-assisted feedback research, as AI tools' ability to provide immediate, personalized guidance can significantly enhance learners' perceived control over their writing process (Jin et al., 2024).

Lantolf & Poehner's (2004) dynamic assessment theory further enriches the theoretical landscape by integrating feedback, intervention, and development within a sociocultural framework. Dynamic assessment views feedback not as a one-time evaluative tool but as an interactive, mediational process that supports learners' potential development. Through iterative cycles of feedback, guided practice, and improvement, learners gradually build confidence by recognizing their growing capacity to master writing tasks. This perspective supports research on multi-agent feedback models, where combined teacher, peer, and AI feedback work together to scaffold learners' development and foster sustained self-efficacy growth (Lantolf & Poehner, 2004).

Complementing these theoretical frameworks, research has established that writing self-efficacy itself is a multi-dimensional construct. Shell et al. (1989) initially proposed a two-dimensional model comprising writing task self-efficacy, which refers to learners' confidence in completing specific writing assignments, and writing skill self-efficacy, which reflects their belief in their ability to use linguistic and rhetorical skills effectively. Subsequent research extended this model to include a third dimension: self-regulatory self-efficacy, or learners' confidence in their ability to plan, monitor, and revise their writing (Bruning et al., 2013; Teng et al., 2018). Domestic scholars have validated these dimensions for Chinese L2 learners, developing context-specific scales that capture the unique challenges and motivational orientations of EFL writers in the Chinese educational context (Tang & Xu, 2011; Li, 2014).

3. Effects of Traditional Writing Feedback

Traditional writing feedback, encompassing teacher, peer, and self-feedback, remains the cornerstone of L2 writing instruction and continues to exert significant influence on learners' writing self-efficacy.

Teacher feedback, as the most authoritative and widely used form of feedback in L2 classrooms, exerts differential effects on self-efficacy based on its type, content, and delivery frequency. Encouraging and specific feedback that balances praise with targeted guidance significantly enhances affective self-efficacy, fostering positive attitudes and reducing writing anxiety. In contrast, pure corrective feedback that focuses exclusively on error correction primarily improves cognitive and skill-related self-efficacy, as it provides clear information about learners' linguistic strengths and weaknesses (Tang & Xu, 2011). Research further indicates that progress-oriented feedback, which highlights improvements over time rather than focusing on remaining errors, is more effective in fostering sustained confidence than error-focused feedback, as it reinforces learners' sense of mastery and growth (Pajares & Valiante, 1999). The frequency of teacher feedback also plays a critical role: weekly feedback that provides ongoing evidence of progress sustains higher levels of writing self-efficacy than infrequent or delayed feedback, which can leave learners uncertain about their performance and erode confidence over time (Xu & Zhao, 2025). However, overly critical or demotivating feedback can have the opposite effect, reducing learners' confidence and increasing writing anxiety (Truscott, 1996).

Peer feedback, by contrast, operates primarily through vicarious experience and affective support, offering unique benefits that complement teacher feedback. Peer feedback allows learners to compare their work with that of their classmates, providing vicarious learning opportunities that help them develop realistic beliefs about their own abilities. For low-proficiency learners, in particular, peer feedback can reduce the pressure associated with teacher evaluation, creating a low-anxiety environment that fosters emotional comfort and confidence (Wu, 2013; Cui et al., 2022). The effectiveness of peer feedback, however, depends heavily on training and consistency. Trained peer feedback that follows clear guidelines and rubrics improves the quality and reliability of comments, ensuring that learners receive constructive, actionable guidance rather than vague or inconsistent feedback (Ruegg, 2018).

Self-feedback, when structured and guided, strengthens self-regulatory self-efficacy by promoting metacognitive reflection and active engagement with the writing process. Guided self-feedback, such as rubric-based self-assessment or checklists that prompt learners to evaluate their own work, encourages them to take responsibility for their writing development, fostering confidence in their ability to monitor and revise their work independently (Zimmerman & Bandura, 1994). Research with Chinese EFL learners has shown that structured self-feedback enhances error-correction confidence and improves learners' ability to identify and address their own writing weaknesses (Gu & Li, 2018). It is important to note, however, that self-feedback is less effective for low-proficiency learners, who may lack the metacognitive skills and linguistic knowledge to accurately evaluate their own work.

4. Effects of AI-Assisted Writing Feedback

The emergence of generative AI tools has introduced a new paradigm of writing feedback, offering unique advantages that address many limitations of traditional feedback practices.

AI-assisted feedback, delivered through tools such as ChatGPT and automated writing evaluation systems, provides immediate, real-time responses to learners' writing, eliminating the delays associated with teacher grading. This immediacy allows learners to receive feedback while their writing process is still fresh, enabling them to make revisions and see progress quickly. Research has shown that real-time AI feedback significantly boosts learners' task confidence, as it provides instant evidence of improvement and reinforces mastery experience (Lund et al., 2023).

Personalization is another key strength of AI-assisted feedback. Unlike traditional teacher feedback, which often follows a one-size-fits-all approach due to time constraints, AI tools can analyze individual learners' writing patterns, identify specific weaknesses, and provide tailored guidance. This personalized feedback addresses learners' unique needs, reducing frustration and increasing the relevance of feedback to their writing development (Jin et al., 2024).

Affective support is a third distinct advantage of AI-assisted feedback. AI tools can deliver feedback in a non-judgmental, encouraging tone, reducing learners' fear of negative evaluation and alleviating writing anxiety. For many learners, particularly those with low confidence in their writing abilities, the non-human nature of AI feedback creates a safe environment where they feel more comfortable taking risks and making mistakes (Chen & Lv, 2024).

Research further indicates that AI-assisted feedback can induce flow experience, a state of deep absorption and enjoyment during writing, which in turn mediates its effects on writing self-efficacy. By providing feedback that is challenging yet achievable, AI tools can help learners stay engaged in their writing, fostering a sense of competence and progress (Teng & Zhang, 2024).

The benefits of AI-assisted feedback are particularly pronounced for low-proficiency learners, who often struggle with basic linguistic skills such as grammar, vocabulary, and sentence structure. AI tools' ability to provide detailed, error-specific corrections helps these learners build foundational skills, increasing their confidence in their writing abilities (Dong et al., 2019).

5. Mediating Mechanisms

Feedback does not directly shape writing self-efficacy in isolation; rather, its effects are mediated by a set of psychological variables that influence how learners interpret and respond to feedback.

One key mediator is flow experience, a state of deep absorption and enjoyment during task engagement. Research has shown that flow correlates positively with writing self-efficacy (Mesurado et al., 2015), and it particularly mediates the relationship between AI-assisted feedback and confidence in writing. AI's ability to provide immediate, tailored support can help learners enter a state of flow more easily, reducing perceived challenge while maintaining a sense of competence (Teng & Zhang, 2024).

A second critical mediator is writing anxiety. Constructive feedback that is specific, supportive, and non-judgmental can reduce learners' anxiety about making mistakes, which in turn enhances their sense of self-efficacy (Woodrow, 2011). AI-assisted feedback appears to alleviate anxiety more effectively than traditional teacher feedback, as its non-human tone reduces the fear of negative evaluation, allowing learners to focus on improvement rather than judgment (Jin et al., 2024).

Finally, academic buoyancy—the ability to bounce back from academic setbacks—acts as a reinforcing mediator. Feedback that fosters writing self-efficacy also strengthens learners' resilience, encouraging them to persist in writing despite challenges. Learners with higher buoyancy are more likely to view feedback as a tool for growth rather than criticism, creating a positive cycle of improved performance and increased confidence (Martin & Marsh, 2008; Xu & Wang, 2023).

6. Model Application Instructions and Teaching Cases

The impact of feedback on writing self-efficacy is not uniform; it is shaped by several learner- and context-related moderating factors.

Learner proficiency stands out as a key moderator, with different feedback types yielding distinct benefits across proficiency levels. Low-proficiency learners often benefit more from peer and AI feedback, as these formats provide accessible, non-intimidating support that reduces anxiety and builds basic confidence. Advanced learners, by contrast, tend to gain more from teacher feedback, which offers nuanced guidance on complex rhetorical and linguistic issues that peer or AI feedback may overlook (Wu, 2013; Dong et al., 2019).

Feedback frequency also moderates effectiveness, with a consistent pattern emerging that weekly feedback sustains higher levels of writing self-efficacy than infrequent or delayed feedback. Regular feedback provides learners with ongoing evidence of progress, reinforcing mastery experiences and preventing the erosion of confidence that can occur when feedback is sparse (Xu & Zhao, 2025).

A third important moderator is feedback specificity. Vague or overly general feedback, such as “good work” or “needs improvement,” does little to clarify strengths or weaknesses and fails to build targeted confidence. Explanatory, metalinguistic feedback, by contrast, that explicitly identifies errors and explains how to correct them, fosters more robust skill-related self-efficacy (Bitchener & Knoch, 2008).

7. Limitations of Existing Research

Despite growing research interest in feedback and writing self-efficacy, several key gaps remain in the literature.

First, the field is dominated by short-term studies that examine only immediate effects of feedback, with few longitudinal investigations tracking changes in self-efficacy over extended periods. This focus on short-term outcomes limits our understanding of the long-term sustainability of feedback-induced confidence gains and their impact on writing development (Sun et al., 2021).

Second, existing research on AI-assisted feedback tends to simplify its underlying mechanisms, rarely disentangling the unique contributions of features such as immediacy, personalization, and affective support. Most studies treat AI feedback as a monolithic variable, rather than exploring how specific design elements shape learners’ self-efficacy in different ways (Jin et al., 2024).

Third, there is a notable lack of contextual diversity in current research, which is heavily concentrated on college-level L2 learners. K-12 and vocational learners, who may face distinct motivational and contextual challenges in writing, remain understudied, limiting the generalizability of findings across educational stages (Zhou, 2025).

Finally, mixed-methods research that combines quantitative measures of self-efficacy with qualitative insights into learners’ experiences remains underutilized. Such approaches would provide a more nuanced understanding of how learners interpret and respond to feedback, going beyond statistical correlations to explore the psychological processes at play.

8. Conclusion

Traditional and AI-assisted writing feedback exert distinct yet complementary effects on L2 writing self-efficacy. Teacher feedback strengthens cognitive and affective confidence through authoritative guidance and evaluative support, peer feedback fosters vicarious learning and emotional comfort through peer interaction, self-feedback enhances regulatory beliefs through metacognitive reflection, and AI-assisted feedback uniquely boosts confidence through immediacy, personalization, and non-judgmental affective interaction. These effects are shaped by a complex interplay of mediating variables, including flow experience, writing anxiety, and academic buoyancy, as well as moderating factors such as learner proficiency, feedback frequency, and feedback specificity.

While existing research has advanced our understanding of feedback efficacy, critical gaps remain. Future research should prioritize longitudinal designs to examine the long-term sustainability of feedback-induced self-efficacy gains, disentangle the unique contributions of AI feedback features, expand contextual diversity to include K-12 and vocational learners, and adopt mixed-methods approaches to explore the nuanced psychological processes underlying feedback response. By addressing these gaps, researchers can develop a more comprehensive understanding of how to design and implement effective feedback practices that foster sustained writing self-efficacy and promote long-term L2 writing development.

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