



# INTEGRATING SCIENCE, THOUGHT, AND TECHNOLOGY: TOWARD AN ARTIFICIAL INTELLIGENT ENVIRONMENT

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## USING AI TOOLS TO ENHANCE WRITING SKILLS IN EFL LEARNERS

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### **Annotation**

*This article offers a critical, up-to-date synthesis of scholarship on the use of artificial intelligence (AI) tools in EFL writing instruction. It clarifies what AI writing tools are, why they are attractive to learners and teachers, how they should be used responsibly, and what pedagogical principles help ensure effective learning. The review weighs documented benefits (e.g., idea generation, higher fluency, targeted corrective feedback, time savings, inclusivity) against risks (e.g., over-reliance, academic integrity, shallow processing, diminished confidence), summarizes empirical findings from diverse contexts, and sketches directions for policy and classroom practice. The paper argues that prohibition is neither realistic nor pedagogically sound; instead, cultivating AI literacy—prompt design, verification strategies, and reflective use—can leverage AI to improve writers' process and products while protecting human cognitive development and authorship.*

**Keywords:** AI, automated feedback, writing tools, writing elements, critical thinking, idea generation, human cognition, academic integrity, essay writing.

Artificial intelligence has moved from speculative fiction into everyday infrastructure, powering mobile devices, search engines, recommendation systems, and professional workflows. Education—especially second/foreign language learning—has felt this shift acutely. As many systems transition from teacher-fronted to learner-centred approaches, AI tools have become part of the ecosystem of resources that promise efficiency, access, personalization, and engagement. In EFL writing, learners and instructors increasingly employ AI for brainstorming topics, planning, vocabulary expansion, grammar and style checking, cohesion/coherence scaffolding, and assessment support. At the same time, rapid uptake raises concerns: dependence, reduced opportunity for deep processing, threats to academic honesty, and impacts on motivation and self-efficacy. This paper synthesizes international and local findings to map the opportunities and the guardrails for responsible classroom integration.

## Methodology

### Conceptual Background: What Counts as an AI Writing Tool?

a) AI writing support spans two overlapping families. Automated Writing Corrective Feedback (AWCF) tools (e.g., Grammarly, ProWritingAid, Ginger) foreground form-focused feedback on grammar, mechanics, and usage, often embedded in browsers and document editors. Automated Writing Evaluation (AWE) systems (e.g., e-rater, IntelliMetric, Intelligent Essay Assessor, Criterion, WriteToLearn, Pigai, MyAccess!) provide holistic ratings and trait-level diagnostics, sometimes with revision guidance. Newer generative systems (e.g., large language models) add capabilities for ideation, outlining, paraphrasing, style transfer, and exemplar generation. In classroom practice, these categories often blend, and tool choice should be guided by learning objectives, proficiency level, and assessment policies.

### b) Documented Benefits and Recurrent Risks

Benefits reported across studies include: (a) faster drafting and revision; (b) improved accuracy and range, especially for surface features; (c) expanded vocabulary and formulaic language awareness; (d) increased engagement through immediate, on-demand feedback; and (e) accessibility gains for learners with limited support. Risks cluster around: (a) over-reliance that suppresses idea development and rhetorical decision-making; (b) uneven or erroneous feedback (false positives/negatives, inconsistent phrasing); (c) challenges to authorship, attribution, and assessment fairness; and (d) potential erosion of confidence when feedback is opaque or overly technical. Crucially, the same tool can be productive or counter-productive depending on task design and learner training.

### c) Evidence Spotlight: AWCF Tools (e.g., Grammarly)

Research on Grammarly illustrates both promise and limits. Studies have documented accuracy gains and perceived usefulness among EFL learners, including standardized-test contexts (e.g., IELTS/CEFR). Yet evaluations also note missed-flagging and over-flagging, repetitive or lengthy comments, and feedback phrasing that swings between over-simplified and overly technical. These inconsistencies mean that tool literacy and teacher mediation are pivotal. For lower-proficiency learners, feedback may be misinterpreted; for higher-proficiency writers, explanations may feel insufficiently nuanced. Clear guidelines and staged introduction therefore matter.

### d) Evidence Spotlight: Generative/Collaborative Tools (Writerly + Google Docs)

A mixed-methods study with EFL students comparing a traditional paper-and-pencil feedback workflow to instruction that integrated Writerly and Google Docs found statistically significant improvements in task achievement, coherence and cohesion, lexical resources, and grammatical

range/accuracy for the experimental group. Learners also reported positive perceptions—engagement, usefulness, supportiveness, and goal orientation. While the combined use of Writerly and Google Docs remains under-researched relative to long-standing AWE systems, early evidence suggests that collaborative writing spaces paired with AI assistants can scaffold meaningful revision cycles when assignments are well designed.

## Results and discussion

### Machine Translation (MT) in the Writing Process

Machine translation (e.g., Google Translate) is ubiquitous and controversial. Critics point to risks for authenticity, originality, and reductionist views of language as code-matching. Proponents argue that targeted MT use—checking lexical options, comparing patterns across L1/L2, or generating initial drafts for contrastive analysis—can support multilingual pedagogies aligned with usage-based SLA. Empirical work shows many students employ MT for speed and convenience, often at the word/phrase level; when incorporated transparently into tasks (e.g., draft-compare-revise), writing quality can improve. The key is explicit instruction on when and how MT helps—and when it obscures nuance, pragmatics, and audience expectations.

### Pedagogical Guidelines for Responsible Integration

- (1) Teach AI literacy early: demystify large language models, probabilistic output, and limitations; practice prompt design and verification.
- (2) Align tools to outcomes: use AWCF for form-focused practice; use AWE and generative systems for planning, genre awareness, and structured revision—not for final-draft outsourcing.
- (3) Scaffold the process: require process artifacts (outline, drafts, revision memos, prompt logs) to keep cognitive work with the student.
- (4) Make authorship visible: ask students to annotate AI-assisted segments and justify adoption or rejection of feedback.
- (5) Calibrate by proficiency: start with constrained features for beginners; expand autonomy as metalinguistic awareness grows.
- (6) Address ethics and policy: define acceptable assistance, citation practices for AI, and consequences for misuse.
- (7) Assess for transfer: include no-AI checkpoints (in-class writing) to ensure durable gains in fluency, accuracy, and rhetorical control.

### Practical Classroom Patterns

- Idea-to-Outline with LLMs: Students generate two outlines from the same prompt using different constraints (audience, tone), then synthesize a third outline reflecting rhetorical choices.
- Feedback Triage: Run drafts through AWCF, categorize flagged issues, and set two personal

grammar goals; verify rules with authoritative sources.

- MT Contrastive Reading: Translate a paragraph with MT, highlight where nuance is lost (stance markers, hedging), and revise accordingly.
- Prompt Journals: Students maintain a log of prompts and outputs, noting what worked, what failed, and how they verified facts—assessed as part of process grades.

### Conclusion

AI-enhanced writing is here to stay. The research base indicates real benefits when tools are embedded within principled pedagogy that foregrounds human judgment, reflection, and practice. Bans are unrealistic; uncritical adoption is unwise. A balanced path—explicit literacy, transparent processes, calibrated scaffolding, and ethics-aware assessment—can help EFL learners write more, revise better, and think critically while retaining authorship and building confidence.

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