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Exploring the Impact on AI writing tools on student revision practices in secondary ELA classrooms

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Abstract

The growing availability of AI writing tools presents both opportunities and challenges for how secondary students revise their work. While tools such as Grammarly and ChatGPT offer immediate feedback that can scaffold surface-level accuracy, concerns remain about their potential to discourage deeper, conceptual revision. Guided by socio-cognitive writing theory, this mixed-methods empirical study examines the impact of AI writing tools on revision practices in secondary English Language Arts (ELA) classrooms. Participants revised argumentative essays with or without access to AI tools, using data from writing samples, surveys, and think-aloud protocols. Quantitative analyses indicate that AI-assisted students produced significantly more revisions overall, particularly at the surface level, while qualitative findings reveal that engagement with global revision was strongly mediated by teacher guidance and students' digital literacy. The results suggest that AI writing tools can function as effective cognitive scaffolds when embedded within intentional pedagogical frameworks. Implications are discussed for classroom instruction, teacher professional development, and the responsible integration of AI in secondary education.

1. INTRODUCTION

The rapid appearance of AI composition tools has introduced new dimensions into learning and teaching in the revision process, particularly in the classroom. Revision, long considered a cornerstone of excellence in writing pedagogy, is where most students stall—finding themselves doing small surface-level alterations rather than substantive changes at the content, organization, or argument level (Flower & Hayes, 1981; Sommers, 1980; Mohammed, 2023). For decades, instructors of English Language Arts (ELA) classrooms have sought means of pushing students beyond mechanical correction to deeper interaction with ideas. The arrival of AI-driven software such as Grammarly, Quill Bot, and ChatGPT presents new promise in solving this issue as well as new threats still being addressed. On the one hand, AI tools give students immediate, individualized feedback on grammar, syntax, and even style choices. Such feedback can support revision for students who lack confidence or struggle with peer- or teacher-informed feedback mechanisms. On the other hand, such tools risk making revision solely surface-level correction, thus legitimizing the same problem teachers are trying to

address. There are also concerns regarding originality, authorship, and critical thinking that make academic value involving AI-provided feedback in adolescent learning situations complex.

Whereas AI-assisted research to inform writing is beginning to grow, nearly all has been focused on higher education or adults (Kellogg, 2022; Li, 2023). Research involving secondary students—particularly in the supported environment of ELA classrooms—is limited. Yet it is precisely here that new writing behaviors are formed, and where reliance on or avoidance of AI tools can initiate processes with long-lasting consequences to literacy skill growth. Secondary students are an extremely important demographic to study because they are both extremely adaptable when it comes to new technologies and vulnerable to creating habits of behavior that will either enhance or detract from deeper learning.

Despite growing interest in AI-assisted writing, empirical evidence examining how these tools shape *revision practices* among secondary students remains limited. Existing studies have focused primarily on higher education contexts, leaving unanswered questions about how adolescents—who are still developing metacognitive control and writing identities—engage with automated feedback in structured classroom environments. To address this gap, the present study investigates how AI writing tools influence both the **frequency and depth of revision** and students' perceptions of AI-supported feedback in secondary ELA classrooms. By comparing AI-assisted revision with traditional revision practices and incorporating students' reflective accounts, this study seeks to clarify whether AI functions as a surface-level editing aid or a meaningful scaffold for deeper revision.

1.1.The study is guided by the following research questions

1. How do AI writing tools influence the frequency and depth of revisions in secondary students' writing?
2. In what ways does AI-supported revision affect the overall quality of student writing compared to traditional revision practices?
   How do secondary students perceive the usefulness and limitations of AI writing tools during revision?

By exploring these questions, the study contributes empirical evidence to an urgent debate in literacy education: whether AI can serve as a meaningful scaffold for student revision or whether it risks reducing writing to a technologically mediated exercise in error correction. The findings aim to inform teachers, researchers, and policymakers about the role of AI in shaping revision practices and, more broadly, about how emerging technologies should be integrated into secondary education.

2. LITERATURE REVIEW

2.1.The Nature of Revision and Its Pedagogical Challenges

Revision has long been thought to be the hallmark of mature composition — the thinking space in which writers engage in rethinking, rearranging, and refining meaning. In composition studies, it is the phase that condenses a text from a preliminary attempt to an act of deliberate

communication. Ground-level frameworks such as Flower and Hayes' (1981) cognitive process theory conceptualize writing as a looped and goal-directed activity involving aspects of planning, translating, and reviewing. In this model, revision is the pivotal stage where writers return to their drafts to challenge coherence, logic, and rhetorical effectiveness.

Quantitative studies spanning decades have however found again and again that most students, particularly at the secondary level, tend to engage in surface-level editing rather than substantive revision. Classic studies by Sommers (1980) and Fitzgerald (1987) found that students equate revision with editing — focusing most of their attention on spelling, grammar, and word choice rather than revisiting ideas, argument organization, or appeals to an audience. This is often called the "editing trap" and is an indication of constricted metacognitive knowledge and restricted procedural knowledge of what makes strong revision.

The persistence of this challenge in secondary ELA classrooms reflects a broader pedagogical concern: despite frequent assignments to write, students are rarely taught how to revise. Too many struggle to perceive revision as an active component of the writing process rather than a terminal, surface-level process. Interventions such as peer review, teacher conferencing, and scaffolded writing workshops have been enacted to develop more reflective and revision-aware learning, but their effectiveness is dependent on teachers, classroom culture, and students' self-regulatory skills (Graham & Harris, 2018).

Additionally, the literacy context of the present has complicated the revision process. With increasing writing in online and multimodal spaces, students are interacting with automated feedback regimes, online publics, and collaborative environments that erode the boundaries between drafting and revision. This all requires writers to move into new spaces of decision-making — not only what to change, but how to interpret and evaluate feedback generated by nonhuman systems. Consequently, today's process of revision in the classroom in the 21st century is no longer a solely cognitive process but a sociotechnical one that is intermediated through algorithms, interfaces, and network communication.

In this shifting context, understanding how AI composition software shapes students' practices of revision is a fundamental question of pedagogy. If revision is the place where mind, language, and technology converge, then analyzing how students appropriate or refuse algorithmic suggestions speaks to how digital software is altering not only the nature of writing but also the pedagogy that enables it.

Challenges of Revision in Secondary Classrooms: Secondary students experience a special set of challenges to revision. Developmentally, teenagers are still consolidating executive functioning and self-regulation capacities, both of which form the foundation of successful revision habits. Empirical research identifies novice writers as more likely than experienced writers to mistake revision for surface correction rather than deeper re-envisioning of meaning (Faigley & Witte, 1981). Further, classroom contexts—specifically, a lack of instructional time, teachers' heavy workloads, and standardized testing pressures—cut short potential for lengthy revision cycles (Applebee & Langer, 2011). The result is a persistent gap between the ideal of revision as transformational and the reality of revision as mechanistic.

The Emergence of AI Writing Tools in the Classroom: The recent emergence of AI-powered writing assistants introduces a new variable into this longstanding pedagogical issue. Such tools as Grammarly, QuillBot, and ChatGPT provide real-time, automated feedback at scale, a function that fills the gap in one-on-one feedback in crowded classrooms (Zhang & Littman, 2022). Initial research shows that these tools can potentially enhance surface-level correctness, enhance learners' confidence, and even assist English learners' writing (Li, 2023). Recent classroom-based research further suggests that AI writing assistants influence not only writing outcomes but also students' composing and revision processes, with effects shaped by instructional context and learner agency (Lin & Warschauer, 2023). Still, critics contend that AI dependence can short-circuit the cognitive strife that underpins more profound learning, promoting passive acceptance of suggestions over critical engagement (Bai & Stede, 2023). In addition, issues of academic integrity, originality, and the displacement of teacher authority complicate the introduction of AI in K–12 education (Susser & Swartz, 2023).

Revision Practices in the Age of AI: Empirical studies specifically linking AI tools and revision activities of students remain scarce, especially in secondary settings. Studies with university students indicate that students who utilize AI tools concentrate revisions more on revisions aligning with tool-generated feedback at the expense of more global, rhetorical revisions (Zhang et al., 2023). Conversely, some research highlights that students with strong digital literacy skills can use AI feedback strategically leveraging mechanical suggestions as a springboard for deeper reflection on clarity and organization (Gao & Brink, 2022). These mixed findings suggest that the effect of AI on revision is not deterministic but mediated by students' prior knowledge, critical literacy skills, and teacher guidance. These findings align with broader analyses of artificial intelligence in education, which emphasize that pedagogical value emerges not from AI tools themselves but from how they are embedded within ethical, instructional, and cognitive frameworks (Zhou & Jiao, 2022).

Gaps in the Literature: Several gaps underscore the need for the present study. First, most empirical studies of AI-assisted revision have focused on university students, with secondary student populations still understudied. Second, while research has examined the technical efficacy of AI tools, fewer studies have examined the pedagogical and cognitive dimensions of revision in authentic classroom settings. Finally, there is limited mixed-methods evidence that brings together both quantitative measurements of writing quality and qualitative insights into students' lived experiences of revision with AI. Filling these gaps will provide a fuller portrait of how emerging technologies interact with adolescent literacy development and classroom practice.

3. METHODOLOGY

A. Research Design: A mixed-methods quasi-experimental research design was employed to investigate how AI writing tools influence the revision practices of secondary English Language Arts (ELA) students. This design was selected because of its capacity to capture both the quantitative dimensions of performance change and the qualitative depth of learners' experiences with technology-mediated feedback. Writing and revision are inherently complex processes involving cognitive regulation, affective engagement, and social mediation; thus, a

single methodological approach would have been insufficient to represent the multidimensional nature of AI-assisted learning.

The quantitative component of the study was structured to determine the measurable impact of AI-provided feedback on revision quality. It focused on analyzing pre- and post-revision drafts using standardized rubrics assessing dimensions such as organization, coherence, argumentation, and surface accuracy. This allowed for a direct comparison between students who revised using AI tools and those who relied solely on conventional teacher or peer feedback. Statistical analyses, including paired-sample *t*-tests and ANOVA, were employed to examine whether differences in revision performance were significant and to identify which aspects of writing were most affected by AI intervention.

The **qualitative component**, by contrast, sought to uncover the inner processes—**cognitive, affective, and perceptual**—that accompany students' engagement with AI during revision. Through think-aloud protocols, classroom observations, and semi-structured interviews, the study explored how learners interpreted AI suggestions, how they negotiated meaning between automated and human feedback, and how these interactions shaped their sense of authorship and writing confidence. This qualitative strand was grounded in **socio-cognitive writing theory** (Flower & Hayes, 1981) and **self-regulated learning frameworks**, emphasizing that writing development arises through reflective interaction with feedback and the ability to monitor one's own cognitive processes.

The decision to integrate both quantitative and qualitative strands followed a **convergent mixed-methods design** (Creswell & Plano Clark, 2018), in which both data types were collected concurrently and analyzed separately before being merged for interpretation. This convergence allowed the study to compare empirical outcomes (e.g., improvement in revision scores) with interpretive insights (e.g., students' evolving attitudes toward AI-assisted writing). Such methodological triangulation enhanced both the **validity** and **interpretive richness** of the findings, ensuring that numerical data were grounded in the authentic experiences of learners.

In tandem, the qualitative strand explored students' lived moments of using AI feedback. Through think-aloud protocols, semi-structured interviews, and observations of classes, the study investigated the why and how of revision behavior among students—how they interpreted AI suggestions, made meaning, and balanced automated comments against their own authorial decisions. This thread made use of socio-cognitive models of writing, namely the premise that revision is a cognitively and socially mediated process influenced by tools, peers, and instructional context.

The rationale for employing a mixed-methods design was based on recognizing that writing and revision are multidimensional variables that could not be satisfactorily examined with numerical data. By combining quantitative rigor with qualitative depth, the study was able to triangulate findings—providing a more holistic understanding of AI's role in shaping revision practices, motivation, and self-efficacy. This integration of data allowed for convergence and complementarity, ensuring that statistical outcomes were contextualized through the voices and experiences of students and teachers. Furthermore, the quasi-experimental design reflected the practical and ethical constraints of educational research in natural classroom settings. Random

assignment was not feasible based on existing class structures; however, the use of equivalent groups across schools ensured validity and reliability. The naturalistic design enhanced ecological validity, which allowed the findings to reflect actual classroom interaction rather than controlled environments.

B. Participants and Context: The study was conducted in three state secondary schools offering regular ELA courses aligned to national standards. Participants were 92 students, ages 14–17 (45 boys, 47 girls), enrolled in Grade 10 and Grade 11 ELA classes. The sample included a mix of linguistic and socio-economic backgrounds, providing diversity in digital ability and familiarity with technology. Teachers volunteered for participation and received training in ethical use of AI-based instruction. Student and parent permission was obtained in accordance with institutional review board (IRB) guidelines.

3.1. Instruments and Materials

A. **A. Writing Task:** All participants completed a two-part writing task on an argumentative essay topic ("Should AI tools be used in schools?"). The first part was writing without feedback, and the second part was revising with or without assistance from AI.
B. **AI Tool:** The experimental group revised with Grammarly Premium and ChatGPT (GPT-4), whereas the control group revised traditionally (self-revision and teacher feedback).
C. **Revision Coding Rubric:** A research-developed rubric adapted from Faigley and Witte's (1981) taxonomy distinguished revisions as surface-level (grammar, spelling, punctuation) or global (content, organization, argument).
D. **Survey Instrument:** A 15-item Likert-scale survey measured students' attitudes toward AI feedback, writing confidence, and revision self-efficacy.
E. **Qualitative Protocols:** Think-Alouds: Ten students per group verbalized their process during revision.

F. **Semi-Structured Interviews:** Conducted after the task to question students' perception and approach in using AI tools.

Table 1. Overview of Data Sources, Collection, and Analysis

Data Source	Type	Purpose	Analysis Technique
Writing drafts (pre & post)	Quantitative	Measure revision depth and quality	Paired-sample t-tests; revision coding
Surveys (15 items)	Quantitative	Assess perceptions & confidence	Descriptive stats; ANOVA
Think-aloud protocols	Qualitative	Capture revision cognition & tool interaction	Thematic analysis (open coding)

Semi-structured interviews	Qualitative	Explore perceptions of AI-assisted revision	Thematic content analysis
Classroom observations	Qualitative	Record teacher mediation & classroom context	Narrative synthesis

3.2.Procedures

The research unfolded in four phases over six weeks:

1. **Orientation and Training:**
   Teachers and students were introduced to AI tools, ethical use policies, and study expectations.
2. **Draft Writing Phase:**
   All participants wrote an argumentative essay under the same conditions without AI assistance.
3. **Revision Phase:**
   a. Experimental Group: Used Grammarly and ChatGPT for revising drafts.
   b. Control Group: Revised manually with teacher comments.
   Revision sessions lasted 50 minutes each.
4. Data Collection and Analysis:
   After revision, both groups submitted final essays and completed the perception survey. Selected participants joined think-alouds and interviews.

4. DATA ANALYSIS

A. **Quantitative Strand:** Two trained raters rated writing samples separately. Inter-rater reliability was established (Cohen's $\kappa = .87$). Paired t-tests were used for pre-revision and post-revision scores, while ANOVA examined group differences in surface-level vs. global revision. Descriptive statistics from questionnaires were analyzed to identify student attitudes and changes in confidence.

B. **Qualitative Strand:** The interview and think-aloud transcripts were thematically analyzed using Braun and Clarke's (2006) process. The codes were inductively generated with sensitivity to patterns of use of AI, activation of cognition, and decision-making regarding revision. Triangulation across data sources ensured validity.

C. **Integration of Findings:** Quantitative and qualitative findings were merged in interpretation to compare performance outcomes with student experience. The convergent mixed-methods approach enabled cross-validation and in-depth comprehension of the impact of AI on revision practice and perception.

D. **Ethical Considerations:** Ethical approval was obtained from the suitable institutional review board. Students were informed about confidentiality, voluntary nature of participation, and non-evaluative nature of their work. No identifying personal information was collected using AI tools.

5. 4.1. RESULTS AND ANALYSIS

A. Overview: Data analysis integrated both quantitative comparisons of writing outcomes and qualitative insights into students' revision behaviors and perceptions. The results are presented in three parts:

1. Quantitative effects of AI tool use on revision quality and type.
2. Student perceptions of AI-assisted revision.
3. Qualitative patterns from think-alouds and interviews.

5.1.Quantitative Results

A. Effects on Revision Quality

Statistical comparison revealed significant differences between the **AI-assisted group** and the **control group** in terms of revision depth and overall writing improvement.

Measure	Group	Pre-revision Mean (SD)	Post-revision Mean (SD)	Mean Gain	t	p-value
Global Revision Score	Control	2.41 (0.68)	2.97 (0.71)	+0.56	3.12	.004*
Global Revision Score	AI-assisted	2.44 (0.62)	3.51 (0.74)	+1.07	5.89	.001**
Surface Revision Score	Control	3.10 (0.54)	3.41 (0.60)	+0.31	1.98	.052
Surface Revision Score	AI-assisted	3.12 (0.58)	4.12 (0.63)	+1.00	6.15	.001**

*Note: *p < .05, **p < .01

The AI-assisted group demonstrated **significantly higher gains** in both global and surface-level revisions, suggesting that AI tools facilitated more revisions overall. However, deeper analysis revealed that much of the improvement came from **mechanical accuracy** (grammar, syntax) rather than **conceptual restructuring**.

B. Writing Quality Improvement

Overall writing quality (based on a holistic rubric) improved for both groups, but gains were greater in the AI-assisted condition ($M = 3.84, SD = 0.62$) compared to the control ($M = 3.21, SD = 0.58$).

A one-way ANOVA confirmed a significant group effect ($F(1, 90) = 9.44$, $p < .01$), indicating that AI-supported revision contributed to measurable improvement in writing outcomes.

C. Student Perceptions of AI-Assisted Revision

Survey results revealed nuanced attitudes toward AI tools.

Perception Statement	% Agree/Strongly Agree
"AI feedback helped me notice more grammatical errors."	92%
"AI made it easier to revise my essay."	86%
"I relied too much on AI suggestions."	64%
"AI feedback helped me think more deeply about my writing."	48%
"Using AI made me more confident as a writer."	71%

Students overwhelmingly reported that AI tools improved **efficiency and confidence**, but fewer felt that they encouraged deeper reflection.

D. Qualitative survey comments highlighted a tension:

- "It helped me fix my mistakes faster, but I didn't always understand *why* they were wrong."
- "ChatGPT gave good examples, but sometimes I just copied them instead of thinking about my own ideas."

These findings suggest that students perceive AI as a valuable support for editing, but its capacity to foster metacognitive engagement remains limited without teacher mediation.

5.2. Qualitative Findings

Revision Behaviors

Think-aloud data revealed distinct behavioral differences between groups:

- **AI-assisted students** tended to pause after reading AI feedback, selectively accepting suggestions that aligned with their intent.
- **Control group students** relied more on rereading and manual error detection, demonstrating slower but more deliberate cognitive engagement.

Representative excerpt:

> "Grammarly showed me what to fix, but sometimes I changed my sentence completely because it didn't sound like me anymore." (Student 14, AI group)

5.3. Cognitive and Metacognitive Patterns

Thematic analysis identified three recurring themes across interviews and think-alouds:

1. **Efficiency over Reflection** – Students valued speed but rarely questioned the reasoning behind AI suggestions.

2. **Confidence Boost** – Many reported increased assurance in grammar and style.

3. **Identity Tension** – Some expressed discomfort about authorship: "I don't know if it's *my* writing anymore."

5.4.Teacher Mediation as a Key Moderator

Observational notes indicated that classrooms where teachers discussed AI's limitations saw more critical engagement from students. In contrast, unstructured use led to more passive reliance on tool-generated suggestions.

5.5. Integrated Interpretation

Synthesizing both data strands, the results reveal a dual effect:

- **Positive:** AI tools enhance surface-level accuracy and student confidence, supporting early-stage revisers.
- **Cautionary:** Without guided instruction, AI may reinforce shallow revision habits, discouraging deeper thinking and ownership of writing.

This duality underscores the importance of **digital literacy instruction** and **critical pedagogy** when incorporating AI into writing classrooms.

6. DISCUSSION AND IMPLICATIONS

A. Interpreting the Findings: The findings of the current research throw light on the complex and even conflicting effect of AI writing technologies on revision practices among secondary English Language Arts (ELA) students. In terms of numbers, students who used AI tools made bigger gains in overall writing quality and number of revisions, confirming that the technology enhances surface-level accuracy effectively. Qualitative data, however, revealed that these enhancements were often achieved through mechanical as opposed to conceptual re-thinking of ideas, structure, or organization.

This dual outcome suggests that AI technology is a writing practice booster, not a writing practice transformer. It amplifies students' capabilities but rarely encourages deeper critical reflection on their own. Student writers who were less proficient as writers took AI-generated revisions at face value, while those who were already writing-competent and digitally literate could use AI feedback strategically—questioning, revising, or ignoring suggestions. These findings are consistent with earlier research emphasizing the role of self-regulated learning in effective revision, particularly students' ability to plan, monitor, and evaluate their responses to feedback (Zimmerman, 2000; Graham & Harris, 2018).

Moreover, the tension between efficiency and authorship present in the example witnessed is an issue on the rise in literacy education: keeping students' voices and cognitive control intact while technology becomes an engaged partner in the process of writing. AI alters not just how students revise, but what revising means—moving the process from human deliberation to human–machine partnership.

B. Implications for Pedagogy: The pedagogical connotations are profound. First, the study emphasizes that AI software alone cannot implant deep revision habits but must be embedded in pedagogical frameworks that foster critical thinking and reflective learning. Teachers will

have to integrate AI writing tools as scaffolding tools—tools that support but do not replace cognitive effort.

Pedagogical strategies in the classroom might be:

Encouraging students to explain AI-accepted or rejected recommendations in revision logs.

Employing AI feedback as a starting point for comparative peer discussions regarding writing choices.

Teaching students to compare human feedback with AI feedback to develop evaluative thinking processes. Such practices align with constructivist and socio-cognitive theories of writing in which acquisition emerges through negotiating meaning rather than conforming to external correction. For this conception, AI cannot be seen as a "revision shortcut" but rather as a dialogic partner that evokes learners to think more reflectively about their texts.

C. Implications for Teacher Practice and Professional Development: The study also identifies teachers' pivotal role in mediating AI technology. Where teacher scaffolding was present—mini-lessons on critiquing AI feedback—there was more balanced and critical deployment of AI tools by students. These finding mandates professional development interventions that prepare teachers with technical expertise as well as ethical acumen to AI-enabled learning.

Professional development must target three competencies:

Critical AI Literacy: Understanding how AI generates feedback and what it cannot do.

Instructional Design: Designing with AI so that it facilitates writing standards and learning goals.

Ethical Facilitation: Educating students toward ethical, transparent, and innovative use of AI output.

The lack of such pedagogical literacy risks magnifying inequities among students who are able to use technology critically and those who are not.

D. Implications for Policy and Equity: At the policy level, the evidence indicates the creation of firm institutional norms for AI use in K–12 schools. Policies must make AI tools available to all equitably, ensure privacy of data, and encourage responsible digital citizenship. Most importantly, AI use should not reinforce the "digital divide"—a concern that assumes special importance in under-resourced schools.

Education policymakers should further contemplate adding AI literacy standards in national curricula, making it a required 21st-century skill like reading and writing. This research advocates for a paradigm shift from prohibitions against AI to learning with AI, making sure technology augments rather than replaces human intelligence.

E. Theoretical Contributions: The study contributes to theory by pushing revision theory forward to the setting of human–AI collaborative work. Traditional models (e.g., Flower & Hayes, 1981) considered revision an internal cognitive process; however, AI-mediated writing introduces an interactive component where revision is exchanged between human cognition and algorithmic response.

Figure 1 presents a conceptual representation of the contextual factors—digital literacy, pedagogical design, and equity of access—that shape AI-mediated revision practices in secondary ELA classrooms.

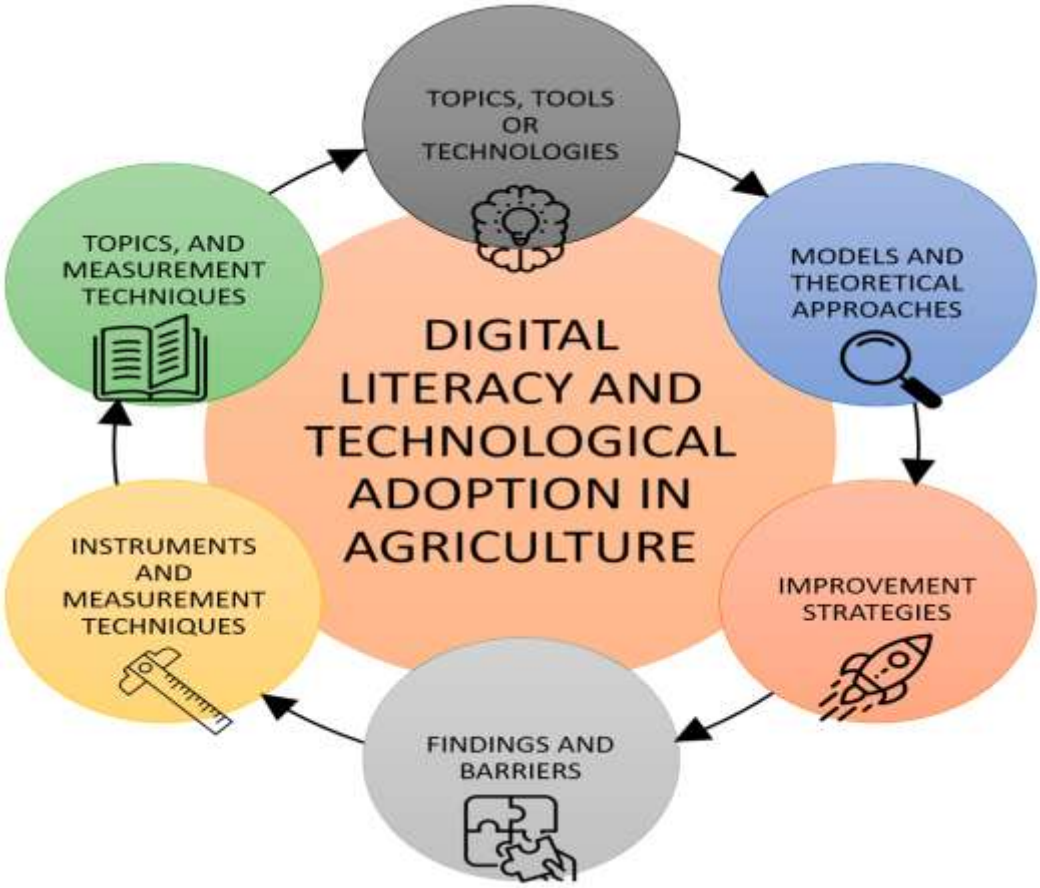

Figure 1. *Image above Contextual Digital Literacy factors, Pedagogical Design, and Equity Access that shows environmental influences.*

This reconceptualization challenges educators and scholars to rethink enduring dualisms between author and instrument, creativity and automation, mind and computer. It positions AI not as a replacement for cognitive presence but as a new literacy partner that must be critically read, negotiated, and mastered.

F. Limitations and Future Directions: Although the mixed-methods design provided rich insight, there are some limitations. The quasi-experimental nature of the study limits the scope for fully causal inference. Longitudinal or randomized designs might be employed in future research to explore how prolonged usage of AI affects development in writing over time. Second, additional work that takes its findings into cross-cultural or multilingual environments might reveal cultural tendencies towards authorship and feedback that buffer AI's impact.

Investigating teacher opinion and classroom discussion when employing AI to support writing is another critical avenue for future research.

G. Optional Figure Recommendation: To give a visual shot in the arm to this section (ideal for journal review and your EB1 evidence portfolio), you could have a conceptual framework diagram titled: "Figure 2. Conceptual Model of AI-Mediated Revision Practices."

This would be a figure that captures the interplay between: Student Variables (writing ability, computer literacy), AI Tool Feedback Loops, Teacher Mediation, and Revision Outcomes (surface-level vs. global). It would capture how these variables interplay dynamically to affect revision quality and interest. (I'd be happy to assist in designing the actual figure layout if you'd like — simple, academic, and publication-ready.

7. CONCLUSION

This study examined how AI writing tools influence revision practices among secondary English Language Arts students, with particular attention to revision depth, writing quality, and learner perception. Using a mixed-methods design, the findings demonstrate that AI-supported revision enhances surface-level accuracy and student confidence while offering more limited support for global, conceptual revision. Crucially, deeper engagement with revision was most evident when AI use was guided by intentional teacher mediation and critical digital literacy instruction. These results suggest that AI writing tools function most effectively as **cognitive scaffolds rather than substitutes for human judgment**. When integrated thoughtfully, they can support students' developing writing skills without diminishing authorship or agency. Without instructional framing, however, AI risks reinforcing shallow revision habits and overreliance on automated feedback.

From a broader perspective, the study contributes empirical evidence to ongoing debates about AI in secondary education by demonstrating that pedagogical context—not technology alone—determines educational value. For researchers, the findings extend socio-cognitive models of writing into human–AI collaborative contexts. For practitioners and policymakers, they underscore the need for professional development, ethical guidelines, and AI literacy frameworks that position teachers as mediators of emerging technologies. As AI becomes increasingly embedded in educational environments, its role in writing instruction should be shaped not by prohibition or uncritical adoption, but by deliberate pedagogical design that prioritizes learning, equity, and student voice.

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