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Improving Students' Writing Skills Through ICT-Based Learning: A Classroom Action Research

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ABSTRACT

Writing remains one of the most demanding productive skills for EFL learners in Indonesian secondary schools, where instruction has traditionally been teacher-centered and insufficiently supported by meaningful technology integration. This Classroom Action Research (CAR) study examines how ICT-based learning affects the writing skills of eleventh-grade students at SMA Negeri 2 Pagar Alam, South Sumatra. A mixed-methods design was applied across two action research cycles, each covering three instructional meetings followed by a writing assessment. The 25 student participants were evaluated on five writing components content development, organization, grammar, vocabulary, and mechanics using an analytic rubric adapted from Jacobs et al. (1981). Quantitative data came from pre-test and post-test scores, while qualitative data were drawn from observation checklists and field notes. Results showed that the overall class mean rose from 57.44 at pre-test to 67.70 after Cycle I and reached 77.22 after Cycle II, a total gain of 19.78 points. The student passing rate climbed from 12% at pre-test to 80% at the conclusion of Cycle II, surpassing the 75% threshold required for the study to be considered successful. Qualitative findings pointed to stronger student participation, more consistent use of ICT tools, and a gradual shift toward process-oriented writing behavior. These outcomes suggest that a carefully scaffolded, multi-tool ICT approach integrating Google Docs, Canva, and Grammarly within a process writing framework can meaningfully improve EFL writing competence at the secondary school level.

Keywords: ICT-Based Learning; Writing Skills; Classroom Action Research; EFL; Secondary Education

INTRODUCTION

Writing in English remains one of the most challenging competencies for secondary school students in Indonesia. Unlike receptive skills such as listening and reading, writing demands simultaneous management of ideas, text structure, vocabulary choices, grammatical accuracy, and mechanical conventions in a language that is not the learner's first. Empirical evidence from Indonesian classroom settings consistently reveals that students at the senior high school level struggle to produce organized, well-developed texts (Setiyaningsih & Haryanto, 2022; Lestari & Wahyuni, 2021). At the operational level, these difficulties manifest in specific and recurring patterns: students tend to produce underdeveloped paragraphs with insufficient supporting detail, rely on L1 syntactic structures that generate grammatical inaccuracies in English, and employ a limited range of vocabulary that

weakens the overall quality of their written output (Kurniasih et al., 2021). A common contributing factor is that writing instruction in many Indonesian schools continues to prioritize grammar drills and text memorization over authentic, process-oriented practice, leaving students with insufficient opportunities to develop genuine writing competence through iterative drafting and revision (Hyland, 2019).

The spread of digital technology in education has opened up new possibilities for addressing these persistent challenges. Information and Communication Technology (ICT) tools now allow students to plan, draft, revise, and share their writing in more dynamic and interactive ways than traditional paper-based methods could support. Platforms such as Google Docs enable real-time collaboration and embedded teacher feedback; visual tools like Canva help students organize their ideas before drafting; and AI-assisted applications such as Grammarly provide immediate, specific feedback on grammar and style. When these tools are integrated within a structured instructional framework, they can shift writing from a passive, one-time task into an active, iterative process (Hyland, 2019).

Despite a growing body of international research supporting the use of ICT in EFL writing instruction (Alqahtani & Meccawy, 2021; Tseng et al., 2020; Habibi et al., 2020), the evidence base from regional secondary schools in Indonesia remains notably limited. The majority of existing studies have been conducted in urban settings or at the university level, where digital infrastructure and student digital literacy are generally stronger. This geographic and institutional concentration creates a meaningful gap in the literature. Schools in regional cities such as Pagar Alam in South Sumatra face distinct contextual challenges including uneven internet connectivity, limited device access, and varying levels of teacher readiness for technology integration. These conditions render direct application of findings from urban or tertiary contexts problematic and underscore the need for context-specific investigation of how ICT-based writing instruction operates under resource-constrained conditions.

This study was designed to address that gap through a two-cycle Classroom Action Research (CAR) project aimed at improving the writing skills of eleventh-grade students at SMA Negeri 2 Pagar Alam through ICT-based learning. The central focus was on five writing components, namely content development, organization, grammar, vocabulary, and mechanics, which were assessed through pre-test and post-test instruments across both cycles. Qualitative data from observation checklists and field notes provided a complementary picture of how students engaged with the learning process. The study examines whether a structured, multi-tool ICT approach can produce meaningful improvements in student writing outcomes within the specific conditions of a regional Indonesian public secondary school.

LITERATURE REVIEW

Previous Related Studies

Several studies have documented the benefits of ICT-based approaches in EFL writing contexts, though their findings vary in scope and instructional emphasis. Habibi et al. (2020) found that blog-based instruction significantly improved narrative writing quality among Indonesian EFL students, with participants showing stronger idea development and greater engagement compared to those in conventional settings. The study highlighted that the authentic, public nature of blog writing motivated students to invest more effort in revision and editing. However, blog-based platforms function primarily as publication environments rather than collaborative workspaces, meaning the feedback loop in that study remained largely teacher-directed. The present research differs in that it employs a multi-tool approach where peer interaction is structurally embedded at the drafting and revision stages, not only at the publication stage.

Lestari and Wahyuni (2021) investigated the effect of Google Docs on collaborative writing among Indonesian EFL learners and found measurable gains in grammatical accuracy and idea elaboration among students who used the platform for peer editing and teacher feedback, alongside a reduction in writing anxiety attributed to the low-stakes nature of digital peer interaction. These findings are directly relevant to the present study, which also employs Google Docs as a core collaborative platform. A critical distinction, however, lies in instructional design: Lestari and Wahyuni used Google Docs as a single-tool intervention, whereas this study integrates it within a broader multi-tool ecosystem that includes Canva for pre-writing planning and Grammarly for self-directed grammar checking. This combination addresses different stages of the writing process simultaneously, which may yield more comprehensive improvements across writing components.

Tseng et al. (2020) examined how structured digital peer review influenced writing development among Taiwanese EFL learners and found that students who participated in online peer review produced syntactically more varied and lexically richer essays compared to those using paper-based review. While the Taiwanese tertiary context differs from the Indonesian secondary school setting of this study, the underlying principle that technology-mediated feedback enhances revision quality is theoretically aligned with the present research. Importantly, Tseng et al.'s participants had stronger baseline digital literacy than the regional secondary students in this study, which means that scaffolding for ICT tool use was a substantially more critical component of the instructional design in the current research context.

Theoretical Foundations of Writing

Writing as a skill has been theorized from multiple perspectives. The cognitive process model proposed by Flower and Hayes (1981) describes writing as a

recursive, goal-directed activity involving planning, translating ideas into text, and reviewing. This model shifts attention away from the final product and toward the process through which writers produce, evaluate, and revise their work. ICT tools align naturally with this process orientation because they make drafting and revision more fluid: changes can be made quickly, multiple versions can be saved, and feedback can be incorporated without rewriting an entire page.

Vygotsky's (1978) sociocultural theory adds a complementary dimension to this discussion. From a sociocultural standpoint, learning is mediated through tools and social interaction. Digital writing platforms function simultaneously as technical tools and social spaces: they mediate the writing process by providing structure, feedback, and resources while also connecting learners to peers and teachers in ways that promote collaborative knowledge construction. The concept of the Zone of Proximal Development is particularly relevant here, as ICT tools can serve as scaffolds that support students in achieving writing quality they could not reach independently.

Writing assessment in this study draws on the analytic framework developed by Jacobs et al. (1981), which evaluates student writing across five distinct dimensions: content development (the extent to which ideas are relevant and fully elaborated), organization (the logical arrangement and coherence of the text), grammar (the accuracy of sentence-level linguistic forms), vocabulary (the appropriateness and variety of word choices), and mechanics (accuracy in spelling, punctuation, and capitalization). This rubric has been widely used in EFL research contexts because it allows for component-specific diagnosis of writing strengths and weaknesses (Weigle, 2002), making it particularly well-suited for an action research design that aims to track progress and target instruction across cycles.

ICT Integration in Writing Instruction

With respect to ICT integration theory, the SAMR model (Puentedura, 2006) offers a critical lens for evaluating the pedagogical depth of technology use in writing instruction. The model distinguishes four levels: Substitution, where technology performs the same task as a non-digital tool with no functional change; Augmentation, where technology performs the same task but with functional improvement; Modification, where technology allows significant task redesign; and Redefinition, where technology enables the creation of tasks previously inconceivable. In the current study, the use of ICT tools was deliberately positioned at the Modification and Redefinition levels. Google Docs enabled embedded, real-time peer feedback that is functionally impossible in paper-based settings, representing Modification. The integration of Canva for visual idea mapping prior to drafting, combined with Grammarly's immediate algorithmic feedback during self-editing, allowed for a writing workflow that redefined the instructional possibilities within a single classroom session. This deliberate positioning at the higher SAMR levels distinguishes this intervention from simple digitization of

existing tasks and undergirds the expectation that it would produce qualitatively different learning outcomes.

METHOD

Design and Samples

This study employed a Classroom Action Research (CAR) design following the cyclical model of Kemmis and McTaggart (1988), which organizes inquiry into four recurring phases: planning, acting, observing, and reflecting. Two complete cycles were carried out at SMA Negeri 2 Pagar Alam, Pagar Alam City, South Sumatra, involving 25 eleventh-grade students (Grade XI) from a single intact class, comprising 13 female and 12 male students aged 16 to 17 years. The class was selected through purposive sampling based on documented below-average writing performance in the previous semester. Each cycle comprised three 90-minute instructional meetings and one assessment session. All participants and the school administration provided informed consent prior to data collection.

Instruments and Procedures

Three instruments were used to collect data. First, a writing test requiring students to produce a descriptive essay of 200 to 250 words was administered as a pre-test and as a post-test at the end of each cycle. Essays were scored using an analytic rubric adapted from Jacobs et al. (1981), with the following component weighting: content development (30 points), organization (20 points), grammar (25 points), vocabulary (15 points), and mechanics (10 points), yielding a maximum total of 100 points. Inter-rater reliability was established through double-marking by the classroom teacher and a trained collaborating rater, achieving a Cohen's Kappa of .82, indicating strong scoring agreement.

Second, an observation checklist was completed by the researcher and a collaborating observer during each lesson. The checklist comprised 15 behavioral indicators distributed across five engagement dimensions: (1) *active participation*, operationalized as frequency of on-task verbal contributions; (2) *ICT tool engagement*, measured by purposeful use of the assigned platforms during instructional tasks; (3) *peer collaboration*, assessed through observable exchange of feedback in Google Docs; (4) *task completion*, defined as submission of a complete writing product within the allotted time; and (5) *enthusiasm and motivation*, recorded through behavioral indicators such as self-initiated tool exploration and voluntary sharing of work. Third, reflective field notes were written by the researcher after every meeting, capturing classroom dynamics, student behavior patterns, and emerging pedagogical insights that informed subsequent lesson planning.

Instructionally, the ICT-based learning package integrated Google Docs, Canva, Grammarly, and curated online resources within a five-stage process writing

framework (Hedge, 2000): pre-writing, drafting, revising, editing, and publishing. In Cycle I, each tool was introduced with explicit step-by-step guidance. During the pre-writing stage, students used Canva to create a mind map outlining their topic, key ideas, and supporting details before composing. In the drafting stage, students composed their essays in Google Docs, enabling the teacher to embed real-time comments. The revising stage involved structured peer review, where students exchanged Google Docs links and left feedback. In the editing stage, students applied Grammarly to check grammatical accuracy, and in the publishing stage, they submitted finalized documents. Based on Cycle I reflection findings, which revealed limited depth in peer review comments and over-reliance on Canva's decorative features at the expense of content planning, Cycle II introduced three targeted adjustments: (a) a structured peer review guide with specific prompting questions was introduced to scaffold more substantive Google Docs commenting; (b) Canva use was restricted to the pre-writing stage only, with time boundaries to prevent over-engagement; and (c) a brief Grammarly orientation session was added at the start of the editing stage to help students interpret and selectively apply automated suggestions rather than accepting all changes indiscriminately.

Data Analysis

Quantitative data from writing tests were analyzed using descriptive statistics, including mean scores per component and overall, standard deviations, and the percentage of students meeting the Minimum Competency Criterion (KKM) of 70. Mean gain scores were computed between the pre-test and each cycle post-test to track improvement across assessment points. Qualitative data from observation checklists were summarized as percentages of students demonstrating each behavioral indicator per cycle. Field notes were subjected to thematic analysis following the framework of Miles et al. (2014), involving data condensation, display, and conclusion drawing. Triangulation across all three data sources was employed to strengthen interpretive validity. The action research was considered successful when at least 75% of students met the KKM in the Cycle II post-test.

Table 1
Writing Score Classification

Score Range	Category
85 - 100	Very Good
70 - 84	Good
55 - 69	Fair
Below 55	Poor

(Adapted from Jacobs et al., 1981)

RESULTS AND DISCUSSION

The results are presented in two sections: quantitative findings from writing test scores across the pre-test, Cycle I post-test, and Cycle II post-test, followed by qualitative observations from the checklist and field notes.

Table 2
Mean Writing Scores by Component Across Assessment Points

Aspect	**Pre-Test**	**Cycle I**	**Cycle II**	**Gain**	**% Gain**
Content Development	58.40	68.90	78.60	+20.20	34.6%
Organization	56.20	67.40	76.80	+20.60	36.7%
Grammar	54.80	64.30	74.20	+19.40	35.4%
Vocabulary	57.60	67.10	76.40	+18.80	32.6%
Mechanics	60.20	70.80	80.10	+19.90	33.1%
Overall Mean	**57.44**	**67.70**	**77.22**	**+19.78**	**34.4%**

(Primary data, 2025. Maximum score = 100)

Table 2 shows consistent improvement across all five writing components. The overall class mean rose from 57.44 (Fair) at pre-test to 67.70 after Cycle I and reached 77.22 (Good) by the end of Cycle II, representing a total gain of 19.78 points or 34.4%. Organization recorded the highest cumulative gain at 20.60 points (36.7%), a noteworthy finding given that organization is often cited as one of the most persistent difficulty areas for Indonesian secondary students (Kurniasih et al., 2021). The improvement in this dimension appears to be directly linked to the Canva-based mind mapping activity, which required students to map their key ideas, supporting details, and text structure before writing. Mechanics earned the second-highest gain (+19.90 points, 33.1%), a result consistent with prior research showing that automated grammar and spelling tools can produce quick, visible improvements in surface-level writing accuracy (Tseng et al., 2020). These patterns are consistent with the instructional design and align with Alqahtani and Meccawy's (2021) observation that visual planning tools in ICT-integrated instruction produced the most pronounced gains in text organization among EFL learners.

Grammar showed the smallest absolute gain among the five components (+19.40 points), a pattern that warrants critical analysis. From a linguistic standpoint, grammatical restructuring requires learners to internalize new syntactic patterns at the level of rule generalization, not merely surface correction, a process that is considerably slower than improvements in mechanics or organizational clarity (Ellis, 2015). Observation data and field notes revealed a recurring pattern: students used Grammarly reactively during the editing stage, accepting or rejecting

suggestions without consistently understanding the underlying grammatical principles. This corrective but unreflective engagement with automated feedback produced improvement at the level of surface error reduction but was insufficient to consolidate deeper grammatical competence. This limitation echoes Tseng et al.'s (2020) observation that technology-mediated feedback is most effective when learners actively process it rather than passively accepting it. The implication is clear: ICT-assisted grammar correction must be complemented by explicit instruction that helps students understand why particular constructions are incorrect, not just that they are.

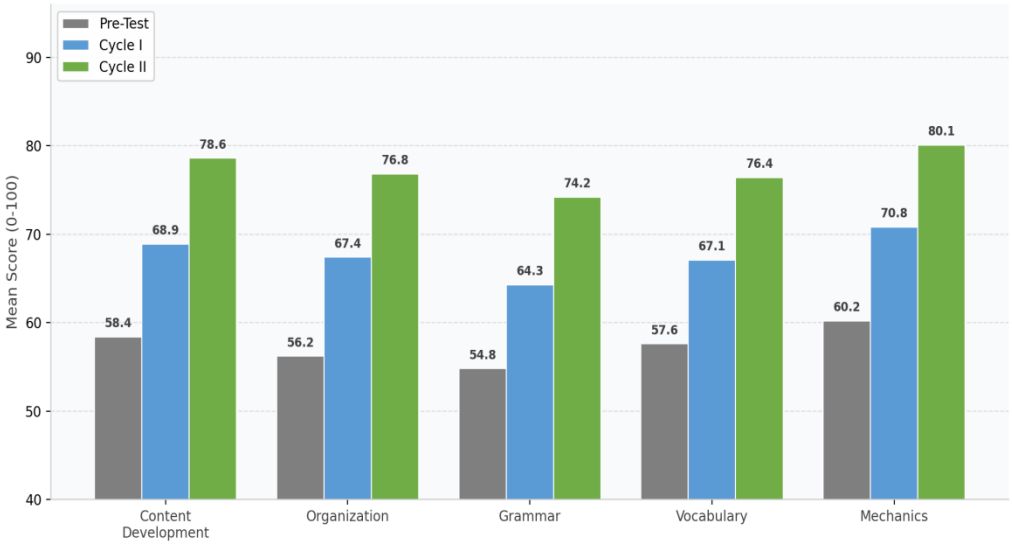

Figure 1. Mean Writing Scores by Aspect Across Three Assessment Points

Figure 1 confirms that the score trajectory for all five components was upward and roughly parallel throughout the intervention, indicating a broad, distributed positive effect of the ICT approach rather than narrow gains in one or two areas. It also indicates that the five-stage process writing framework functioned holistically: pre-writing activities improved organization and content, the drafting and revising stages supported vocabulary and grammar development, and the editing stage contributed to mechanical accuracy.

Table 3
Student Pass Rate Distribution Across Assessment Points

Category	**Pre-Test**	**Cycle I**	**Cycle II (n)**	**Cycle II (%)**
Score ≥ 70 (Pass)	3	11	20	80%
Score < 70 (Below Standard)	22	14	5	20%
Total	**25**	**25**	**25**	**100%**

(Primary data, 2025. KKM = 70)

Table 3 tracks the number of students meeting the KKM of 70 at each assessment point. At the pre-test, only 3 students (12%) met the passing threshold, a figure that underlines the severity of the writing challenge the class faced before intervention. After Cycle I, this number rose to 11 students (44%), indicating that roughly half the class had crossed the passing mark following the first round of ICT-based instruction. By the end of Cycle II, 20 students (80%) met or exceeded the KKM, surpassing the 75% success criterion established for this action research and leaving only 5 students below the threshold. Notably, even those 5 students showed improvement from their individual baselines, with a mean individual gain of 12.4 points, suggesting that the intervention was beneficial for all students, though not sufficient to bring every learner to the passing level within the two-cycle timeframe.

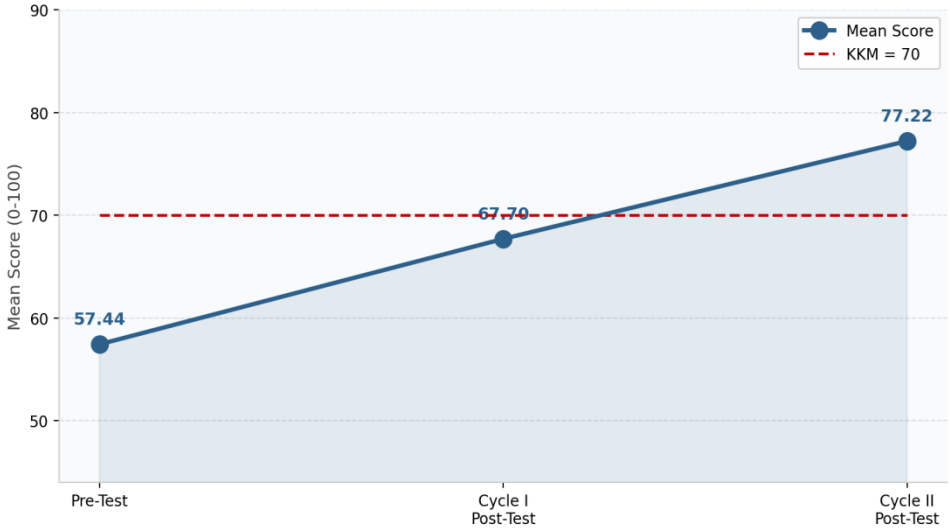

Figure 2. Overall Mean Writing Score Progression from Pre-Test to Cycle II Post-Test

Figure 2 plots the trajectory of the overall class mean against the KKM reference line. The consistent upward slope from 57.44 to 77.22 illustrates that the improvement was not a one-time spike but a sustained trend reinforced by the iterative, reflective nature of the action research design. The gap between the Cycle I mean (67.70) and the KKM (70.00) was relatively small, which provided a clear and actionable signal during the reflection phase that drove the pedagogical adjustments in Cycle II. This kind of data-responsive planning is one of the core advantages of a CAR framework for technology integration research (Burns, 2010).

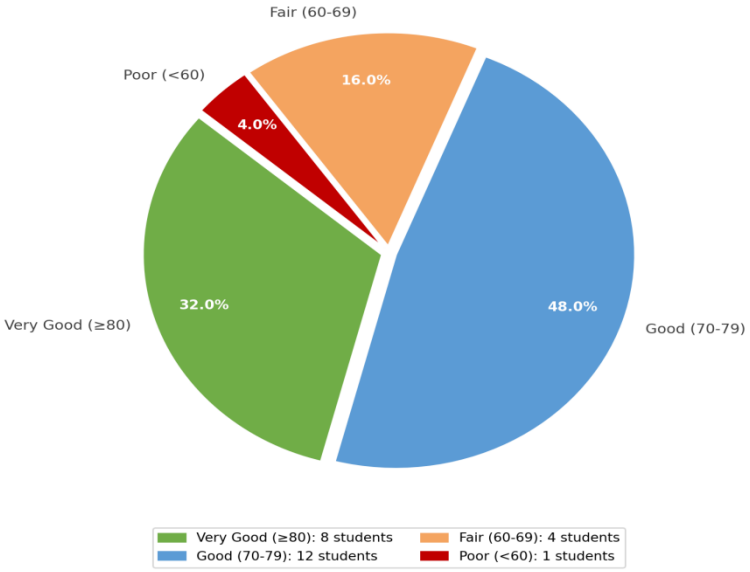

Figure 3. Distribution of Student Achievement Levels in Cycle II Post-Test (n = 25)

Figure 3 shows that the largest group, 12 students or 48%, fell in the good category (scores 70 to 84), followed by 8 students (32%) in the Very Good category (scores 85 and above). Four students (16%) remained in the Fair range, and only 1 student (4%) fell in the Poor category. The improvement was spread across different ability groups, with students who started in the Poor category generally moving up to Fair or Good by Cycle II.

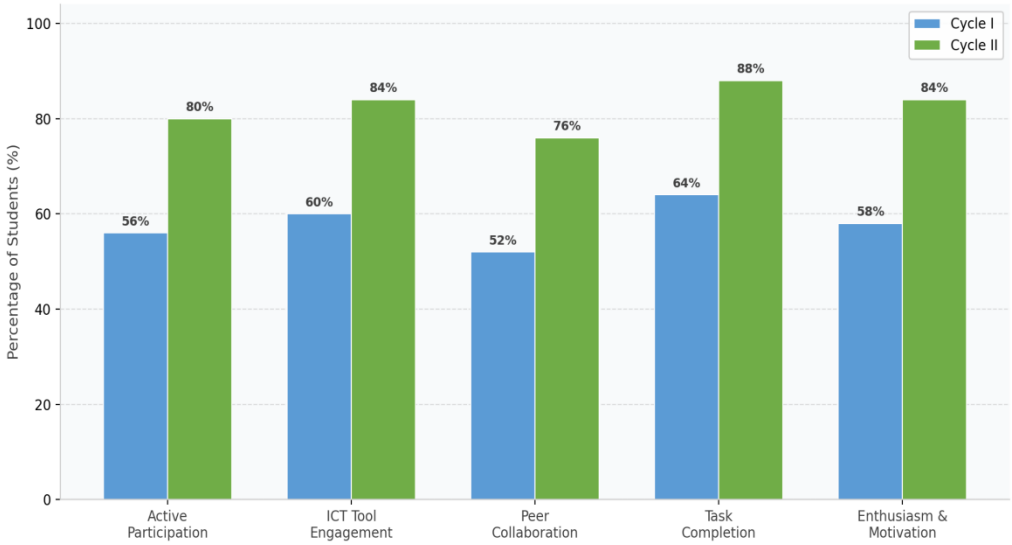

Figure 4. Student Engagement Indicators Based on Observation Checklist (Cycle I vs. Cycle II)

Figure 4 shows improvement across all five behavioral dimensions. Task Completion reached 88% in Cycle II (up from 64% in Cycle I) and ICT Tool

Engagement reached 84% (up from 60%). These gains in engagement coincided with observable improvements in writing product quality. Field notes documented concrete examples of writing development between cycles. In Cycle I, a representative student essay in the content development category included sentences such as *"Pagar Alam is a city. There are many places there. People go to see the place."* By Cycle II, the same student produced: *"Pagar Alam is a natural city in South Sumatra that is known for its tea plantations and cool mountain climate. Tourists visit the Dempo Mountain area because it offers beautiful scenery and fresh air, making it a popular destination for families and nature lovers."* This qualitative shift reflects improved idea elaboration, sentence variety, and descriptive specificity, consistent with Habibi et al.'s (2020) finding that authentic writing contexts and iterative feedback promote deeper engagement with content development.

Field notes from Cycle I recorded that peer commenting in Google Docs was superficial, typically limited to single-word evaluations such as 'good' or 'okay,' reflecting both unfamiliarity with the platform and reluctance to critique peers in writing. Following the introduction of structured peer review guides in Cycle II, commenting became substantially more specific. Representative Cycle II comments included observations such as 'Your second paragraph needs more explanation about why tourists visit this place' and 'The grammar in the third sentence is confusing, maybe try a shorter sentence.' This behavioral change reflects what Flower and Hayes (1981) describe as a shift toward expert writing practice: treating text as revisable and feedback as a resource for improvement rather than a judgment.

The findings of this study are broadly consistent with, but also extend, the existing literature on ICT-integrated writing instruction. Lestari and Wahyuni (2021) reported a passing rate increase of approximately 35 percentage points in a Google Docs intervention among Indonesian EFL learners at the university level. The present study achieved a 68-percentage-point increase (from 12% to 80%), which is substantially larger. Several factors may account for this difference. First, the multi-tool design in this study addressed different stages of the writing process simultaneously, whereas Lestari and Wahyuni's intervention was confined to the drafting and peer review stages. Second, the two-cycle CAR structure allowed for mid-intervention pedagogical adjustment, which improved peer review quality and tool use efficiency in Cycle II. Compared to Tseng et al. (2020), who found stronger gains in grammatical complexity among university students, this study found more pronounced gains in organization and mechanics among secondary students. This pattern is theoretically consistent with Krashen's (1985) input hypothesis: lower-proficiency learners tend to benefit most from structured input and form-focused feedback at the surface level before progressing to more complex syntactic development. The convergence of these findings supports the conclusion that ICT integration is effective across different educational levels and contexts, though the magnitude and distribution of gains are shaped by learner proficiency level, instructional design, and contextual constraints.

Despite these positive outcomes, several limitations warrant acknowledgment. The single-class design limits generalizability. The absence of a comparison group means that improvements cannot be attributed exclusively to the ICT intervention, as maturation and other within-semester factors may have contributed to score gains. Additionally, the persistence of five students below the KKM and the relatively more modest grammatical gains signal that ICT-based learning alone is not a sufficient response to complex writing development needs. Targeted and explicit grammar instruction, differentiated support for lower-proficiency learners, and extended practice time remain necessary complements to any technology-integrated writing program.

CONCLUSION

This study demonstrates that a structured, two-cycle ICT-based learning intervention produced meaningful improvements in EFL writing skills among eleventh-grade students at SMA Negeri 2 Pagar Alam. The class mean rose from 57.44 to 77.22 across the intervention period, and the student passing rate increased from 12% to 80%, exceeding the 75% success benchmark. Gains were documented across all five writing components, with Organization and Mechanics showing the largest improvements. Qualitative data confirmed strengthening student engagement and a gradual shift toward process-oriented writing behavior across both cycles. The findings contribute to a context that is underrepresented in the existing literature public secondary schools in regional Indonesian cities where digital infrastructure and student ICT literacy cannot be assumed. The results suggest that when multi-tool ICT integration is scaffolded within a coherent process writing framework and is responsive to cycle-by-cycle reflection, meaningful writing gains are achievable even under resource-constrained conditions. Future research should address the limitations of the current design by employing larger and more diverse samples across multiple schools, incorporating longitudinal follow-up assessments to examine retention of writing gains, and using controlled comparative designs to isolate the contribution of specific tools or tool combinations. The role of teacher facilitation quality in enabling effective ICT integration also warrants dedicated investigation.

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