

Article

MALL Based Writing Instruction: Assessing the Effectiveness of Digital Platforms Among ESL Learners

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Abstract: Nowadays, mobile-assisted language learning (MALL) has emerged as a globally adopted approach that builds on the earlier development of computer-assisted language learning (CALL) by utilizing the accessibility and flexibility of mobile devices to promote independent and self-directed learning. It enables learners to extend language practice beyond classroom boundaries and provides authentic opportunities to engage with English as a Second Language (ESL). This study investigates the potential of digital platforms, specifically WordPress and Hemingway Editor, in enhancing the writing skills of non-native English learners within a MALL framework. WordPress offers a collaborative digital space where learners can publish, share, and receive feedback on their writing, while Hemingway Editor provides real-time analytical feedback to improve readability, grammar, and stylistic accuracy. The research adopted a quantitative design with both control and experimental groups to examine the effectiveness of these platforms. Participants included ESL learners who engaged in structured writing tasks, with their progress assessed through pre- and post-tests. The findings of the study reveal that learners using WordPress and Hemingway Editor demonstrated notable improvements in writing performance when compared to the control group. The integration of these tools not only improved grammatical accuracy and stylistic clarity but also encouraged active participation, reflection, and learner autonomy. The results emphasize the pedagogical value of incorporating MALL strategies into language instruction, particularly for developing essential writing skills among ESL learners. In conclusion, this research affirms that mobile technologies, when strategically integrated into teaching, significantly enhance learning outcomes and offer sustainable pathways for improving ESL writing proficiency.

Keywords: ESL Learners; MALL Approach; Writing Skills; Wordpress

1. Introduction

English Language Teaching (ELT) is a wide field of study concerned with the development of non-native English language competencies, including the four primary skills such as listening, speaking, reading, and writing. Writing is one such difficult skill to acquire for English as a Second Language (ESL) students. Writing is an activity involving the combination of various sub-skills like grammar, vocabulary, coherence, and organization [1]. The introduction of Information and Communication Technology (ICT) has revolutionized language learning by making available new technology for writing pedagogy. Mobile-Assisted Language Learning (MALL) is now a dynamic strategy that provides real-time interactive feedback and self-study options. Platforms like WordPress and Hemingway Editor

facilitate students to participate in writing assignments within an organized and guided learning setting, enhancing their accuracy of grammar, proficiency in spelling, and quality of writing [2,3].

In spite of the central role of writing in ESL learning, most students struggle to master this skill as a result of linguistic, cognitive, and cultural barriers [4]. Writing in English requires knowledge of discourse conventions, coherent argumentation, and the proper tone and register for various settings. As mentioned in **Figure 1**, the steps for the writing process should be followed. Academic writing, for example, demands formality of tone and organization of argument, whereas informal writing permits a relaxed tone. ESL students have to deal with such differences, plus grammatical precision and coherence in writing. Conventional teaching of writing usually does not provide on-the-spot feedback, which is essential for developing skills, and hence, incorporating technology becomes essential in compensating for this deficiency. The ICT's role in ELT, through MALL-based writing platforms in this case, plays a significant part in developing the writing skills of students. Studies have proven that ICTs enable systematic writing exercises, promote peer-to-peer collaboration, and offer real-time feedback, which are all essential elements to the learning process [5,6].

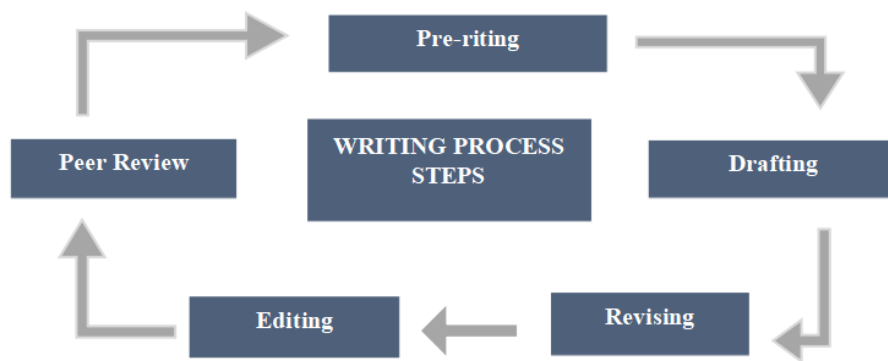


Figure 1. Steps for Writing.

This research aims to assess the effectiveness of writing instruction based on MALL in ESL classrooms, particularly for undergraduate Cybersecurity students. The study examines how tools such as WordPress and Hemingway Editor improve students' writing skills, motivation, and practice frequency [7,8]. With the growing demand for digital literacy in professional and academic environments, this research aims to offer suggestions on best practices in incorporating technology into ESL writing instruction. Bridging the disconnect between conventional and digital learning models, the study provides worthwhile insights for educators, students, and policymakers. Finally, the infusion of ICT tools into the MALL environment signifies a huge step forward for ELT. With the use of digital platforms, ESL students can master writing skills, setting them up for academic and professional success in the digital age. This research adds to the body of emerging studies on digital learning and reaffirms the need to incorporate technology into ESL writing education for better results. In the post-pandemic learning environment, hybrid and flipped designs are increasingly valued for their ability to enhance perceived autonomy, stabilize emotions, and build self-efficacy, all of which are associated with higher engagement and achievement. Within this framing, the present study positions WordPress and Hemingway Editor as affective scaffolds: WordPress provides a structured, authentic audience that enhances social value and relatedness, while Hemingway delivers immediate, controllable feedback that reinforces competence and reduces error anxiety. Together, these tools address both the social and individual affective needs of ESL learners in a hybrid learning context.

The study's significance is its ability to examine teaching of ESL students' writing abilities through WordPress and Hemingway Editor through the MALL approach, and aims to explore the following research questions:

1. What is the effectiveness of ICT tools with the MALL framework in enhancing writing skills among ESL learners?
2. How do learners get motivated for writing using these platforms, WordPress and Hemingway?

2. Survey of Literature

Using digital resources with their flexibility allows learners to write at their own pace while making the learning process simple with instant feedback using tools like Grammarly that corrects grammatical errors [9]. According to Jesús Andrés López Henao [1], the influence of Information and Communication Technology (ICT) using writing skills has been developed through online platforms. Digital platforms reconstituted the learning experience for English as a Second Language (ESL) learners by providing dynamic, interactive, and engaging ways to enhance writing skills [10]. These platforms include tools like grammar checkers, collaborative writing apps, and real-time feedback systems, which enable learners to identify and correct mistakes in a solitary state. Technology-integrated learning development is a method that uses digital tools to improve the quality and effectiveness of education [11–13]. It is considered one of the most advantageous digital platforms due to its easy accessibility. ESL learners make use of their time for writing practice, not only in classroom settings. It promotes creativity and self-expression and encourages learners to explore various genres and formats on platforms like sites, language exchange apps, blogging, and educational software. In the research, the method encourages collaborative, more interactive, and relevant learning experiences [14]. It enables learners to share their work, receive effective feedback, and learn from peers through interactive learning tools such as Google Docs and discussion forums on digital platforms.

According to Li [15], participants revised their writing significantly more using electronic (i.e., word-processing) programs than they did when relying on hand-written samples. According to Clerehan, Turnbull, Moore, and Tuovinen [16], they also designed an Online Student Resource Centre website that offered tutorials and downloadable resources whose ultimate purpose was to support students' self-directed means of developing English language and academic skills. The Mobile-Assisted Language Learning (MALL) approach has become a rising method in English Language Teaching (ELT) for the past few years, especially for writing skills for those who learn English as a second language. MALL allows students to practice their language and develop their proficiency to actively participate in a process of socialization [17–20]. While various reviews of MALL studies have been reported, according to Afzali et al. [18], Yang [19], and Viberg & Grönlund [20], they present a broad context that requires further investigation of the areas of study, including learning collaboration and learners' autonomy. In the MALL approach, the flexibility, approachability, and interplay of mobile devices provide an easy-going and learner-centered platform for giving a talk on these challenges.

In the beginning stage, mobile devices come with continuous access to writing abilities, such as digital dictionaries, writing prompts, and grammar checkers, which help learners clarify their work in real-time. For example, digital platforms like Grammarly, Hemingway Editor, and Quillbot offer immediate feedback on grammar, sentence structure, and punctuation, enabling learners to identify and correct errors while writing. According to Pachler et al. [21] and Hsu et al. [22], teachers are now able to construct an extensive model of instruction allowing students to interact and engage in a learning discussion after school hours.

The increasing reliance on digital tools in education has positioned Mobile-Assisted Language Learning (MALL) as a key area of innovation in ESL writing instruction. Previous studies have shown that blogging platforms such as WordPress provide learners with opportunities for reflective writing, collaborative interaction, and enhanced motivation, thereby improving writing fluency and confidence [1,2]. In parallel, automated editing tools such as Grammarly, Quillbot, and Hemingway Editor have been widely reported to improve grammatical accuracy, sentence clarity, and learners' self-editing skills [3–5]. However, most prior studies have treated these tools in isolation. There remains a gap in examining how the combined pedagogical use of a collaborative publishing platform (WordPress) and an autonomous editing tool (Hemingway) can work together within a structured intervention to enhance ESL writing skills.

This gap can be further framed through the Technology Acceptance Model (TAM), which explains that learners' willingness to adopt educational technologies is shaped by two main constructs: perceived ease of use and perceived usefulness [6]. WordPress, with its structured publishing and interactive features, aligns with learners' preference for collaborative learning spaces, while Hemingway Editor, offering immediate readability and grammar feedback, enhances self-regulated editing practices. Recent studies demonstrate that when these elements are combined, learners not only improve the quality of their writing but also develop higher motivation to engage in continuous practice [7].

In the post-pandemic era, MALL research has increasingly focused on self-regulation, digital fatigue, and sus-

tained learner motivation. A recent comparative study in Hong Kong and South Korea revealed that cultural expectations and prior educational experiences shape how learners regulate their mobile-based English learning [8]. While mobile applications enhance autonomy and accessibility, the study highlighted challenges such as fluctuating motivation and digital fatigue. These insights reinforce the need for interventions that strike a balance between structured guidance and flexible learner autonomy. Positioning WordPress as a platform for structured, collaborative learning and Hemingway as a tool for autonomous editing, the present study responds to this need by exploring their combined effect in a controlled ESL writing context.

Language learning has evolved across traditional classroom settings in the modern age of online resources, becoming more approachable and actively engaged. Boosting their ability to write has become one of the most challenging tasks English as a Second Language (ESL) students have to do. Writing is often one of the most challenging tasks for ESL students. According to Ablezgova [3] and Imran (2022), Hemingway App identifies complex sentences, excessive use of adverbs, and unnecessary words, which helps writers improve the clarity of their text. Digital platforms that include the Hemingway editor emerged as effective tools to assist students in emphasizing their ability to write and confidence in themselves in their language skills, thereby identifying these barriers [21,22]. Hemingway is a digital tool that assists in automatically editing English-written resources [23,24].

Hockley (2019) supports the technological devices that can ensure that all learners, regardless of the limits of their ability or disabilities, get the opportunity to access material for learning. It started out as a parent language tool, but it has since been implemented to benefit those who don't speak the language, making it a vital tool for ESL learners. Internet Explorer and Firefox, Word from Microsoft, Google Docs, and mobile apps are a few of the platforms on which the network is easy to use and successful. Hemingway Editor assists ESL students in recognizing typical mistakes in their written work and comprehending the reasons behind them through informal changes and clarification. Wilson & Roscoe [25] argued that automatic evaluations can provide learners with immediate feedback, allowing them to identify their areas of weakness and adjust their research methods accordingly. This immediate feedback is essential to help learners strengthen their skills in writing in a way that regular classroom instruction frequently comes from a lack of it. Navigating the complicated principles of English grammar as well as syntax is one of the biggest challenges faced by English-as-a-second-language learners. According to Negari [4], teachers can create their own activities or follow the model of a text; a text can be constructed on the board or overhead as a whole class activity with the learners contributing the language. According to Shadiev & Feng (2023), these AI-powered resources can help students with a variety of tasks, including grammar correction, translation, text summarization, sentence paraphrasing, and much more.

While blogging platforms such as WordPress have been shown to enhance reflective writing, peer feedback, and motivation among ESL learners [25,26], studies on automated editing tools such as Grammarly, Quillbot, and Hemingway Editor emphasize improvements in grammar and sentence clarity. However, the majority of prior research treats these tools separately, focusing either on collaborative publishing or on autonomous editing. Very few studies have examined how such tools might be combined within a single intervention to balance peer-driven interaction with independent self-editing. This study addresses this gap by integrating WordPress and Hemingway Editor into an ESL writing program, thereby testing their complementary effects on learners' writing accuracy, coherence, and motivation.

Recent post-pandemic studies have further highlighted the role of learner perceptions and cultural context in shaping engagement with mobile tools. For instance, Lee, Park, and Chan [26] conducted a comparative study of self-regulated English learning in Hong Kong and South Korea, using the Technology Acceptance Model (TAM) to show how perceived ease of use and perceived usefulness affect sustained adoption of digital platforms. Their findings emphasize that cultural expectations and prior educational experiences strongly influence learners' willingness to engage in self-directed mobile learning. Drawing on these insights, the present study frames WordPress as a structured, collaborative platform that supports guided peer interaction, and Hemingway Editor as an autonomous tool that fosters self-editing and individual responsibility. By combining the two, this research seeks to address the need for balanced interventions that accommodate both structured and flexible learning preferences in ESL writing instruction. Recent work in applied linguistics has highlighted the role of affective variables in sustaining writing engagement. Control-value theory suggests that learners' emotions are shaped by their sense of control over tasks and the value they assign to them. In MALL-based ESL writing, these findings are particularly relevant: WordPress aligns with value and relatedness through collaborative publishing and formative commentary, while Hemingway

Editor aligns with perceived control and competence by offering low-friction, immediate feedback. Taken together, these affective pathways explain why technology-supported writing interventions can sustain motivation beyond novelty effects. If TAM is retained as a framing lens, perceived ease of use and usefulness may be understood as operating indirectly through enjoyment and self-efficacy, which in turn drive engagement.

3. Theoretical Framework

The Mobile Assessed Language Learning (MALL) approach uses portable electronics, such as tablets and smartphones, to assist individuals in learning languages. The MALL approach, which relies on the theoretical interaction, mobile learning, and acquisition of languages, emphasizes versatility, accessibility, and individualized possibilities for learning. Its theoretical structure emphasizes the value of acquiring knowledge outside of the conventional classroom by allowing students to utilize language skills at any time and from any location.

There are several advantages to mobile-assessed language learning. It facilitates individualized instruction through flexible applications, improves accessibility by letting learners interconnect through knowledge while on their own, and increases participation with multimedia materials, including interactive tests, pictures, and applications. Collaboration-based technologies, such as blogs and social media platforms, allow users to converse with contemporaries and native speakers, and contextual opportunities that make use of real-life situations promote language fluency. Furthermore, the MALL tools' immediate evaluation accelerates growth, as given in **Figure 2**.

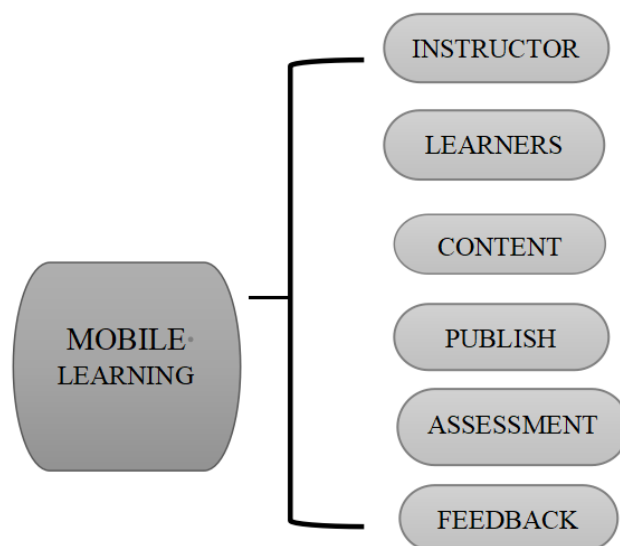


Figure 2. Mobile Learning.

Further explore the different aspects of possibilities and limitations regarding mobile-assisted language learning. Although MALL introduces a new concept to language learning, there are several barriers that do not allow this innovative approach to be widely accepted and effective. The underlying restrictions of technology itself are the most significant challenge. Learners using outdated or less sophisticated technology encounter the problem of inadequate access to instructional resources and platforms due to technology compatibility concerns.

Distractions are also another challenging obstacle. Even though smartphones make MALL quicker, their widespread usage also makes them effective distraction resources. Activities, social media notifications, and other non-academic applications can capture the attention of any learner, potentially disrupting their concentration and learning process. Moreover, psychological overload as well as effective learning can be hindered by the flooding of knowledge and short-term internet content. The absence of equality in online understanding seems a further significant problem. Another possibility is that neither learners nor educators have the technical skills necessary to make efficient use of MALL resources. Learners may struggle to navigate the online sources of learning a language, critically evaluate the elements, and navigate the online platforms.

While technology presents the most imaginative and fascinating opportunities for learning, one must recognize its shortcomings of it and not trivialize the importance of standard teaching methods. Effective language learning remains dependent on direct interaction with learners, collaborative tasks, and the acquisition of critical interpersonal and communication skills through experiential learning. Despite MALL's potential to transform language learning, we must recognize and resolve a number of complex issues. Through addressing technological constraints, reducing interruptions, closing the technological literacy gap, guaranteeing content quality, and promoting fair access, we can fully utilize MALL to develop simulating, modified, and successful language learning endeavours that benefit learners from every walk of life. Integrating these perspectives, we propose a pathway in which MALL affordances (ease of use, usefulness) enhance perceived control and task value, which foster positive emotions such as enjoyment and increased writing self-efficacy. These emotions then drive engagement behaviors such as more frequent drafting, revision, and peer feedback, culminating in improved writing performance.

4. Methodology

4.1. Research Design

This study investigates the effectiveness of the MALL approach for enhancing writing skills through the use of ICT tools, particularly WordPress and Hemingway Editor, using a pre- and post-test experimental group design. There are two groups in the design: the control group and the experimental group. The control group receives conventional writing instruction without the use of ICT tools, specifically WordPress and Hemingway Editor. The writing capacities of the individuals in both groups are evaluated using both the pre-test and post-test assessments. This makes it possible to contrast the mean score of the two groups with the goal of figuring out whether traditional instruction or the MALL approach using technological tools is more successful at developing writing proficiency.

4.2. Sample of the Study

The sample for this study is 76 ESL learners, selected through convenience sampling. Convenience sampling was necessary because it was accessible to the learner population; indeed, the participants had direct access since the researcher herself was in the class. The sample is only female students, aged 18–19 years. This gives a homogeneous demographic profile in the sample, but there is heterogeneity in the students' academic backgrounds, interests, and learning styles. The sample was divided into two groups: the control group and the experimental group, each consisting of 38 students. The division attempted to limit extraneous variables and ensure that the groups would be relatively equal in terms of academic ability and language proficiency. The control group received traditional instruction, while the experimental group received instruction through the Mobile-Assisted Language Learning, or MALL, approach. The researcher adopted a controlled experimental design where the given effect of the MALL approach on learners' writing skills was distinguished, and its effectiveness in enabling them to achieve their desired writing abilities was obtained.

4.3. Research Procedure

This study used the quantitative method, which included both an experimental and a control group **Table 1**. Both groups are pre-tested on their prior writing abilities as part of the research. For the duration of four weeks, the experimental group of students was taught how to use digital technology such as WordPress and Hemingway Editor for the form of writing, with a particular focus on the four topics from the general English subject syllabus, while the control group received writing instruction using conventional methods without any knowledge about ICT tools. Every individual in the experiment group worked independently on enhancing their proficiency in writing, as the instructor thoroughly guided them through how to make use of these online resources.

Table 1. Population of the study.

S.No	Institution	Group	Total
1.	ESL Learners	Control	38
2.		Experimental	38
Total Population			76

The experimental group had received encouraging comments concerning the procedure for writing, which motivated learners to use the digital resources more frequently. Following the four-week intervention, post-tests were given to both groups, and the data analysis was carried out through SPSS software to assess the enhancement of writing abilities between the experimental and control groups **Figure 3**.

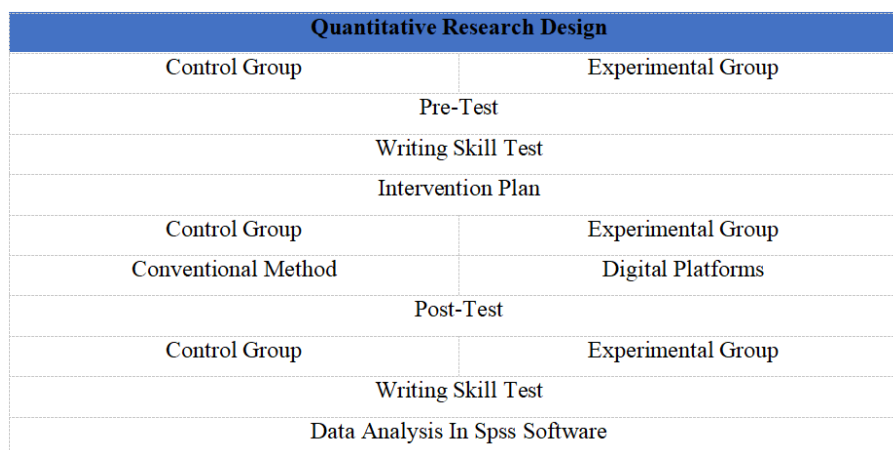


Figure 3. Flowchart of the Research Procedure.

Within 50 minutes, we describe an entire lesson plan that engages and integrates digital applications to enhance writing skills. The five stages of the learning procedure structure the lessons, allowing for contributions in the final stage. As an instructor, they specifically guide learners to encourage an engaging learning environment. The digital tool and the intriguing activities inspire learners in the experimental group for collaboration and help them develop better writing skills (**Figure 4**).

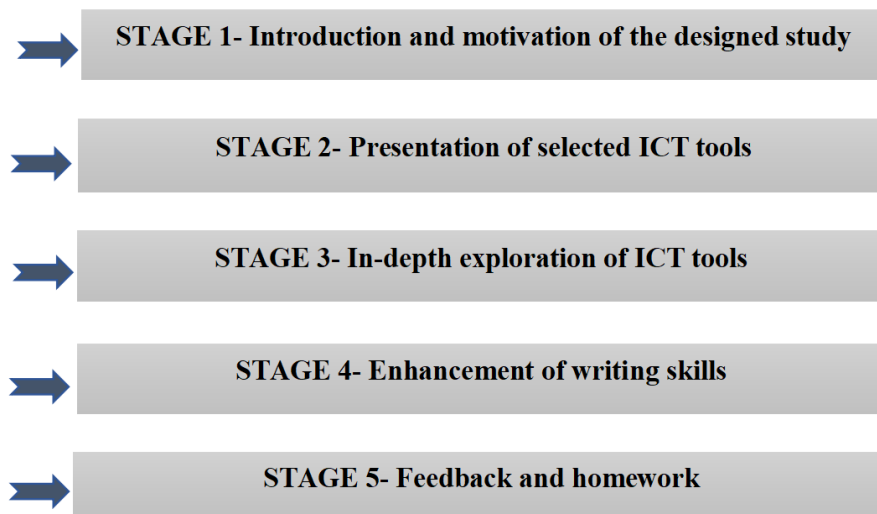


Figure 4. Stages in the Intervention Plan.

In this study, participants were selected through convenience sampling from the ESL Learners, which we acknowledge as a limitation as it restricts generalizability and excludes the possibility of random assignment. The assessment instruments included both pre-test and post-test writing prompts, which asked learners to produce short argumentative and descriptive essays on topics from their general English syllabus. Student responses were evaluated using a scoring rubric that measured four key dimensions: grammar, vocabulary, coherence, and organization.

The intervention lasted four weeks, with the experimental group receiving two 50-minute sessions per week. Students were expected to publish at least four WordPress posts and complete revisions based on feedback. Both the control and experimental groups received comparable instructor time and attention; the only difference was the absence of digital tools in the control group.

4.4. Research Tools

4.4.1. WordPress

WordPress is a content management system that allows learners to create blogs, websites, and articles. Using themes and plugins supports various writing styles for learners, such as academic, creative, etc., and by comments and trackbacks encourages interactive and collaborative learning. Learners can easily access and versatile for publishing and showing written work.

4.4.2. Hemingway Editor

Hemingway Editor is an online editing tool for learners to improve writing clarity and writing style, and also highlights passive voice, adverbs, hard-to-read text, and complex sentences. It highlights the error through color-coded suggestions to correct the mistakes. It is useful for learners to improve grammar, readability, and conciseness.

4.5. Research Instruments

4.5.1. Frequency Test

The frequency analysis indicates that students in the experimental group performed more writing tasks than those in the control group. The enhancement of writing frequency indicates that instruction based on MALL encouraged students to write more frequently.

4.5.2. Wilcoxon Signed-Rank Test

The Wilcoxon signed-rank test is a test for two related samples, and it tests to find if there is any difference between their population mean ranks. The test can be employed whenever data do not form a normal distribution. Ranks are formed from differences in the paired observations, and on that basis, the positive and negative ranks' sums are checked to determine the significance.

4.5.3. Mann-Whitney U Test

The Mann-Whitney U test is a non-parametric test that compares two independent groups to see if their distributions are different. It ranks all the observations and then compares the groups' sum of ranks. It is applied when the data is not normally distributed and can be used as a substitute for the independent t-test.

The Likert-scale items in this study primarily assessed writing improvement and error reduction. While these reflect learners' perceptions of progress, they were not sufficient to form reliable multi-item constructs for self-efficacy or enjoyment. As such, these affective pathways are acknowledged but remain unmeasured. Future work will incorporate short, validated pre-/post measures of writing self-efficacy and enjoyment to capture these processes more directly. The design of the present intervention, however, already aligns with hybrid engagement principles, pre-class micro editing using Hemingway supported learners' sense of control and competence; in-class collaborative publishing and feedback on WordPress enhanced task value and social presence; and structured revision cycles provided iterative opportunities to consolidate skills.

5. Data Analysis

Student writing was evaluated using a rubric that covered four key dimensions: grammar, vocabulary, coherence, and organization, with scores assigned independently by the instructor using a 5-point scale. In addition, students' perceptions were collected through Likert-scale items, where such perception data are presented, outcomes are described as associated with perceived improvements.

Comparative analysis of the English writing skills of ESL Learners (Experimental group) is presented in this 4.1 frequency table before the pre-test, without the use of digital tools, and after the post-test of the use of digital

tools. **Table 2** has a division of four points (1,3,4 and 5) where the greater number shows the highest deal along with the statements. The 38 responses in all reflect the way participants feel about improving their writing.

Table 2. Frequency of pre- and post-test data.

		Digital Tools Have Improved My English Writing. It Is Better Than Before, When I Was a Beginner (Post)				Total
		1	2	4	5	
My English writing skills have been enhanced by digital tools. It refined initial efforts. (Pre)	1	0	0	1	0	1
	3	0	0	3	5	8
	4	2	1	9	12	24
	5	1	0	1	3	5
Total		3	1	14	20	38

In the experimental group, post-test received the responses 20, with a score of 5 that indicating a strong belief that using digital tools greatly enhanced writing abilities. The positive impacts of digital tools have been strengthened by the 14 responses that were submitted under the score 4 in the post-test categories.

Although a score of 5 in the experimental group, the common response is 5 years earlier than adopting digital tools in the pre-test. Finally, the overall number of pre-test responses was lower than post-test responses. In the pre-test, the results are more disconnected, reflecting various perspectives about the initial enhancement of writing skills. The score of 4 shows that response 24 is the highest. This data reveals those participants viewed digital tools positively, with an evident rise in ratings after use, since the data is statistically significant. Increases in score from pre- to post-test responses show an overall improvement in writing skills, showing the benefits of digital tools in improving earlier tasks of writing and improving writing skills which can be seen in **Figure 5**.

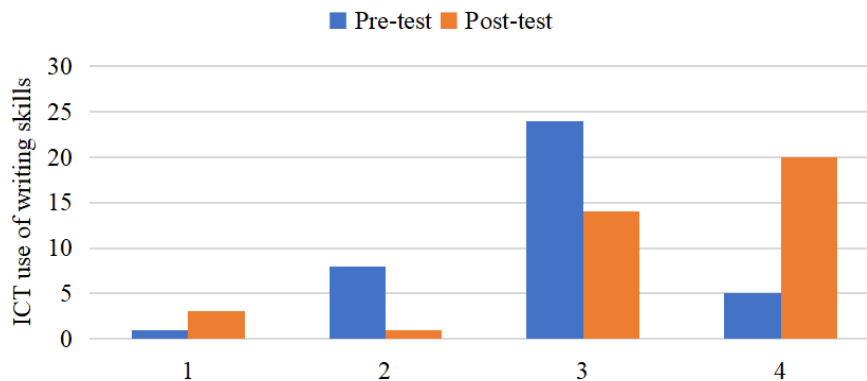


Figure 5. Graphical representation of pre- and post-test collected data.

An experimental group of pre-test and post-test results was compared with the help of the Wilcoxon Signed-Rank Test in **Table 3**, which was used to find out the positive impacts of digital tools on enhancing writing and minimizing errors. The test examined whether responses before and after making use of digital tools improved significantly. Five participants responded with negative rankings; the mean ranks show 18.40, and the sum of the ranks shows 92.00, indicating a decrease in the views. Twenty-one participants responded and received positive ranking, mean rank shows 12.33, and sum of ranks shows 259.00, and 12 participants replied no change in using digital tools in the first variable, "Digital tools have improved my English writing" that indicates an improvement in the writing skills in the overall 38 participants.

There are 8 participants with negative rankings, the mean ranks show 10.38, and the sum of the ranks shows 83.00, a decrease in the views. Positive rankings received 16 responses from the participants, with a mean rank shows 13.56 and a sum of the ranks shows 217.00. Participants of 14 rely that no change of using digital tools in the second variable, "Whenever I used minimized errors in my writing while using digital tools — Whenever I wrote, I prevented errors in my writing with digital tools" that indicates an improvement in writing without any writing errors using digital tools, since the data is statistically significant.

Table 3. Wilcoxon Signed-Rank Test Results (Experimental Group, n = 38): Pre- vs. Post-test Writing Scores.

Variables		N	Mean Rank	Sum of Ranks
Digital tools have improved my English writing. It is better than before, when I was a beginner.	Negative Ranks	5	18.40	92.00
	Positive Ranks	21	12.33	259.00
	Ties	12		
	Total	38		
Whenever I used to write, I minimized errors in my writing while using digital tools. Whenever I wrote, I prevented errors in my writing with digital tools	Negative Ranks	8	10.38	83.00
	Positive Ranks	16	13.56	217.00
	Ties	14		
	Total	38		

Table 4 shows the results of statistical tests assessing the effect of digital tools on writing skills in English. Two writing improvement and minimizing errors statements were tested, for which Z-scores and *p*-value (Asymp. Sig. 2-tailed) are available. The first statement, "Digital tools have improved my English writing. It is better than before when I was a beginner," had a Z-score of -2.196 and *p*-value (Asymp. Sig. 2-tailed) of 0.028. The second statement, "Whenever I used to write, I minimized errors in my writing with digital tools", was -2.002 on the Z-scale and 0.045 on the *p*-value. The Z-scores reveal the standardized deviation from the mean, with negative values indicating below-average deviation from the expected. In both instances, the Z-scores are negative, which suggests that the respondents tended to agree with the statements but varied in their answers. The significance values (*p*-values) are vital in determining if the results are statistically significant. A *p*-value of less than 0.05 in the data is statistically significant, in that there is little chance of the differences found being due to chance. Both statements' *p*-values in this test, at 0.028 and 0.045, are less than 0.05, showing that the outcomes are statistically significant at the 5% level.

Table 4. Test Results.

	Digital Tools Have Improved My English Writing. It Is Better than Before, When I Was a Beginner	Whenever I Used to Write, I Minimized Errors in My Writing While Using Digital tools. Whenever I Wrote, I Prevented Errors in My Writing with Digital Tools
Z	-2.196	-2.002
Asymp. Sig. (2-tailed)	0.028	0.045

The first statement, concerning general writing enhancement as a result of digital tools, has a lower *p*-value than the second statement, and thus is more statistically significant. This suggests that the respondents recognized general writing enhancement more strongly than error reduction. The z-score for this statement, -2.196, is slightly lower than that of the second statement, -2.002, which further supports the view that the perception of general writing enhancement was slightly stronger than that of error reduction. The second statement error minimization when utilizing digital tools, since the data is statistically significant, though to a slightly larger *p*-value of 0.045 than statement one. The data is statistically analysed, which reveals respondents to be confirming error prevention as an advantage of digital tools, though to a somewhat lesser extent than overall improvement in writing.

Overall, the results show that digital tools significantly impact English writing skills, with a notable effect on general writing skills improvement and error minimization. The slightly stronger significance of the first stat suggests that learners perceive an overall enhancement in their writing ability more confidently than they perceive a reduction in writing errors. These results highlight the significance of language learning and writing development through digital tools, with their ability to improve writing ability and minimize errors.

Table 5 gives the result of the Mann-Whitney U test, comparing responses in the control group and experimental group to a post-test across three different variables for improvement in writing with digital tools and instructor feedback. The test is a non-parametric alternative to the t-test and is utilized here to compare response ranks between groups. The findings reveal that the experimental group showed higher mean ranks all the time, indicating a meaningful effect of online interventions on writing ability.

In the case of the variable measuring the effect of instructor comments on writing development, the control group had a mean rank of 30.55, while the experimental group showed a mean rank of 46.45. The Mann-Whitney U was 420, Z-score -3.356, and *p*-value 0.001. Since the *p*-value in this case is less than 0.05, the data is statistically significant, and implies that experimental group learners found a significantly higher impact on their writing de-

velopment by virtue of comments provided by the instructor relative to the control group. For the effectiveness of web resources in spelling and grammar checks, the control group had a mean rank of 30.08, and the experimental group had a mean rank of 46.92.

Table 5. Mann-Whitney U Test – Comparing post data of the Control and Experimental Group.

Variable	Control Group Mean Rank	Experimental Group Mean Rank	Mann-Whitney U	Z-score	p-value
The instructor's comments on the website helped me grow as a writer.	30.55	46.45	420	-3.356	0.001
I used the web resource linked to confirm my spelling and grammar issues in my own writing.	30.08	46.92	402	-3.617	0.001
Whenever I used to write, I minimized errors in my writing while using digital tools.	32.92	44.08	510	-2.341	0.019

The Mann-Whitney U was 402, the Z-score was -3.617, and the *p*-value was 0.001. This high statistical significance indicates that the learners in the experimental group perceived web resources to be more effective in validating spelling and grammar errors than those in the control group. For reducing writing errors with the use of digital tools, the control group's mean rank was 32.92, and that of the experimental group was 44.08. The Mann-Whitney was 510, the Z-score was -2.341, and the *p*-value was 0.019. While this *p*-value is still below 0.05 and statistically significant, it is slightly less strong than the other two variables, suggesting that learners in the experimental group believed digital tools helped them minimize writing errors more than learners in the control group, but the effect was not as pronounced. Generally, the results convincingly indicate that the experimental intervention, probably structured digital feedback and web-based writing resources, was of significant benefit to learners' writing improvement perception, accuracy in spelling and grammar, and reduction in errors. The low *p*-values for all three variables clearly imply that such differences are improbable due to chance. The stable superior mean ranks of the experimental group support the strength of the intervention. The empirical evidence for this study supports the application of technological tools and feedback from instructors as a means of improving writing skills, and this shows that writing instruction can significantly benefit learners if technology is introduced into it.

6. Discussion

This study shows that using WordPress and Hemingway Editor in ESL writing classes can really improve students' writing skills in a short amount of time. The results from the tests before and after showed clear improvements in grammar, vocabulary, coherence, and organization for students who used these platforms, compared to those who did not. This shows that organized digital tools like WordPress and self-editing help from Hemingway can work together to improve writing, making it more accurate, clear, and smooth. The findings match earlier studies that show how helpful mobile and computer-based language learning tools can be for improving writing accuracy and helping learners become more independent.

This study also adds to existing research on MALL by highlighting the advantages of using two different kinds of digital platforms, one for working together and one for working alone. Previous research has looked at blogging platforms like WordPress and automated feedback tools such as Hemingway and Grammarly separately. However, our findings indicate that using these tools together helps learners achieve a good mix of working with peers and editing their own work independently. It should be noted that TAM constructs were not directly measured in this study; rather, TAM is applied here as a conceptual lens to interpret learners' responses to the platforms in terms of perceived ease of use and usefulness. The Technology Acceptance Model (TAM) helps us understand why students liked using WordPress and Hemingway. WordPress made it easier for them to interact with their peers in an organized way, while Hemingway gave them the freedom and confidence to edit, but the findings also highlight difficulties that relate to ongoing research in mobile-assisted language learning after the pandemic. Some people in our study said they were excited about Hemingway at first, but later they felt that editing their work over and over became boring. In the same way, WordPress promoted interaction among peers, but it needed a lot of help from facilitators to keep everyone involved. This information shows that MALL platforms can be effective, but their success relies on creating different tasks that are timely and keep learners interested while minimizing tiredness. Future studies should look into how structured and flexible tools can work together in ways that match what learners pre-

fer, fit their cultural backgrounds, and support their long-term learning goals. WordPress and Hemingway could help ESL students improve their writing through a structured program. The findings indicate that working together on online publishing and self-directed digital editing can be adapted for different ESL/EFL learning situations.

Non-normality of score distributions was confirmed through Wilcoxon tests ($p < 0.05$) and visual inspection of histograms, which justified the use of nonparametric analyses. Effect sizes (r) were calculated for all Wilcoxon and Mann-Whitney tests, and 95% confidence intervals are reported to aid interpretation of magnitude.

Affective Mechanisms: The observed improvements can be interpreted through the lens of affective engagement. Hemingway Editor likely increased perceived control and competence by providing immediate, manageable feedback, while WordPress heightened task value and social presence by connecting learners to an authentic audience. Together, these experiences likely fostered positive emotions such as enjoyment and strengthened writing self-efficacy, sustaining engagement throughout the intervention. It demonstrates that enjoyment is not incidental but a performance-relevant emotion that promotes persistence and higher-quality writing. Our findings suggest that enjoyment and self-efficacy may have been underlying drivers of learners' willingness to draft, revise, and refine their work. Practical design implications include using short, varied writing tasks, offering visible progress cues (e.g., readability improvements), and providing low-stakes iterative feedback to reduce anxiety and maintain motivation.

7. Findings and Conclusions

The findings support the Technology Acceptance Model (TAM), which states that learners accept technology based on perceived ease of use and usefulness [6]. WordPress was excellent for collaborative learning and Hemingway straightforward for individual editing, which may explain improved involvement and outcomes. ESL writing practice increases with user-friendly digital platforms.

The research findings revealed that the combination of WordPress and Hemingway Editor greatly enhanced ESL learners' writing abilities. The experimental group revealed significant improvement in clarity, grammatical correctness, and general quality of writing. Statistical tests such as the Mann-Whitney U Test and Wilcoxon Signed-Rank Test supported significant differences between the control and experimental groups. Students using digital tools showed fewer errors in writing, higher motivation, and improved self-editing skills. A WordPress blog called on students to perform revisions based on the feedback of instructors, enhancing writing skills. Issues such as online distraction and dependency on mobile phones were observed, referring to the need for structured guidance.

The research concludes presents empirical evidence favoring MALL-based writing instruction as an effective method for ESL learners. The use of digital tools not only improved writing skills but also promoted motivation and confidence. Although the study recognized challenges such as technological dependency and distractions, its findings affirm that integrating technology into writing instruction produces positive results. The research recommends a blended model of integrating digital resources with conventional instruction for improved outcomes. Subsequent studies may investigate long-term effects and wider applications of MALL-based writing instruction in varying learning settings.

These findings align with post-pandemic MALL research highlighting both opportunities and challenges in mobile learning. Lee, Park, and Chan [26] observed that while self-regulated learning through mobile apps promotes autonomy, learners often struggle with fluctuating motivation and digital fatigue. Similarly, our participants benefited from the structured support of WordPress and the autonomous editing provided by Hemingway, but some reported distractions and reliance on mobile tools. This underscores the importance of designing writing activities that are shorter, varied, and engaging to sustain motivation and reduce fatigue.

8. Limitations

This study is subject to several limitations. First, the participant group consisted only of undergraduates aged 18–19, which restricts the generalizability of the findings to broader populations. Second, the intervention lasted only four weeks, making it difficult to assess the long-term sustainability of the observed improvements. Third, participants were selected through convenience sampling without random assignment, which may have introduced bias. Finally, while this study focused on WordPress and Hemingway Editor, future research should include other digital platforms and more diverse samples to provide a more comprehensive understanding of Mobile-Assisted

Language Learning in ESL writing instruction. Finally, while the study highlighted self-efficacy and enjoyment as central affective pathways, these constructs were not directly measured. A priority for future work is to include validated scales and test a mediation model linking perceived control and value to enjoyment and self-efficacy, and in turn to engagement and writing performance. This will clarify not only whether MALL interventions work, but also the affective mechanisms through which they support ESL learners in hybrid contexts.

Author Contributions

Conceptualization, M.M.L., A.B.R., P.K.; methodology, L.K.S., J.S.R.J.; software, L.K.S., J.S.R.J.; validation, M.M.L., A.B.R., and P.K.; formal analysis, A.B.R., P.K.; investigation, M.M.L., A.B.R., P.K.; resources, L.K.S., J.S.R.J.; data curation, L.K.S., J.S.R.J.; writing—original draft preparation, M.M.L., A.B.R., P.K.; writing—review and editing, L.K.S., J.S.R.J.; visualization, L.K.S., J.S.R.J.; supervision, A.B.R., P.K.; project administration, M.M.L., A.B.R., P.K.; funding acquisition, L.K.S., J.S.R.J. All authors contributed equally to the conception, design, data collection, analysis, and writing of this study. All authors have read and agreed to the published version of the manuscript.

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Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

Data will be available on request.

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Conflicts of Interest

The authors declare no conflict of interest.

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