



USING WRITEFULL AS AI-POWERED ENGLISH WRITING ASSISTANT TO IMPROVE PARAGRAPH WRITING PERFORMANCE FOR THE 11TH GRADERS AT A SCHOOL IN THAI NGUYEN

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Abstract:

This research examined how Writefull, as an online instructional writing Assistant powered by artificial intelligence (AI), can enhance 11th-grade students' paragraph writing performance at Ly Nam De High School, Thai Nguyen province. The study used an action research design to implement, over the course of a 10-week intervention, both quantitative and qualitative measures to determine the writing quality and students' perceptions of Writefull as a support tool. Thirty students participated in the study. Pre-tests and post-tests were used to measure students' writing quality in the areas of grammar accuracy, vocabulary, coherence, and organization. Questionnaire results indicated that students had a positive orientation towards Writefull as an effective learning tool. Results from the writing assessment tool indicated statistically significant improvements with moderate effect sizes in each of the measures of students' writing quality. The students reported a positive view towards Writefull's feedback in real-time as well as the grammar-checking functionality, as the two features they perceived as significant contributors to their writing development; recognized limitations, such as a lack of downloadable app functionality and software compatibility, were provided by some students. The results highlight the potential impact of Writefull as an effective education tool for EFL writing development, as well as the need for continued iterations of the app to improve the technical issues identified by some students and reach a wider audience for in-class applications.

Keywords: Artificial Intelligence, Writefull, paragraph writing, EFL learners, educational technology

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1. Introduction

The importance of writing in English as a foreign language (EFL) has been a topic of considerable interest and concern in the current educational sphere. Writing is known to be one of the most difficult skills to develop due to multiple task demands, including knowing vocabulary and grammar, as well as creating ideas and organizing and articulating them (Walsh, 2010; Harmer, 2007). As a productive skill, like speaking, writing is one of the foundational skills required to develop communicative competence (Sharma, 2004). When focusing on high school students in Vietnam, writing skills are especially important because writing has academic implications as well as long-term communicative implications. Despite the importance, developing learners' writing skills in EFL environments is complicated for a variety of linguistic, pedagogical, and contextual factors (Derakhshan & Shirejini, 2020; Nguyen, 2021).

Many studies have been conducted around the world about barriers to developing writing skills. For example, Islam et al. (2019) in Bangladesh found that large class sizes, lack of instructional time, and unsuitable learning styles were barriers to writing development. Similarly, Sun (2010) and others addressed barriers to development among Chinese learners. In Vietnam, barriers are evident in the limited pedagogical practices focused on form without development of communicative and rhetorical skills (Nguyen, 2009). While collecting data at Ly Nam De High School in Thai Nguyen province, researchers observed many students struggling to complete paragraph writing tasks. The students often relied heavily on model texts. There was evidence of insecurity in writing independently. Midterm and final assessments confirmed the weaknesses, where most students performed below average on writing proficiency tasks. Based on these findings, more innovative pedagogical approaches or methods are required to develop EFL writing instruction.

The rapid developments of technology and, more specifically, artificial intelligence have now offered a new opportunity to address these barriers in language education (Petersen, 2021). AI-based writing assistance such as Writefull has been shown to provide real-time feedback on grammar, vocabulary, coherence and organization, to assist learners while they write (Bouchoux, 2019; Mammadova, 2019). Writefull utilizes natural language processing (NLP) and machine learning to analyze written language and provide feedback for increasing accuracy and fluency. Therefore, Writefull can serve as an exciting addition to writing instruction in EFL contexts.

The study details the implementation of Writefull among 11th-grade learners at Ly Nam De High School, to examine and understand its impact on students' paragraph writing performance and attitudes towards using the tool. In conjunction with the 2018 General Education Program, in Vietnam, by the Ministry of Education and Training (MOET), aimed at communicative competence and a balanced skills approach, using artificial tools across the curriculum, including developing writing skills, may be a timely and viable path for teachers and learners alike.

2. Research Questions

To guide the investigation, the following research questions were posed:

- 1) How does the use of Writefull enhance students' paragraph writing performance?
- 2) How do students evaluate their experience with Writefull as an AI writing assistant?

2. Literature Review

Writing is recognized as one of the most challenging and complex skills in second and foreign language learning (Hyland, 2003; Walsh, 2010). In contrast to receptive skills such as reading and listening, writing demands learners to produce language and utilize their knowledge of grammar, vocabulary, mechanics and organization of discourse. In EFL contexts, writers face additional difficulties because they generally perceive less opportunity to use authentic English in classrooms, and learners are socialized toward exam-dominant pedagogy (Nguyen, 2009). Researchers have noted that writing is not merely knowledge of encoding, but also a cognitive and social activity that involves idea generation, argument construction, and audience addressing (Tribble, 1996; Harmer, 2007).

In the Vietnamese context, reformers have noted that writing instruction emphasizes grammar is clear. Generally, this deprives learners of the opportunity to gain competence, confidence and independence in articulating ideas, resulting in formulaic and simplistic written products (Nguyen, 2021). The writing approach is product-based, where teachers provide a model text and students are expected to imitate a given text, rather than the explicit scaffolding of the writing process. Therefore, the context lends itself toward a need for approaches that balance accuracy, fluency and communicative value in student writing.

Literature has documented factors that create an ongoing barrier to effective writing instruction in EFL learners. Derakhshan and Shirejini (2020) remark that writing involves a relatively high amount of accuracy and creativity. Because of this, students may struggle to master writing as a skill more than other skills. These challenges are problematic given student contexts, such as large classes, short periods, and teacher training (Islam et al., 2019). Students also report problems coming up with ideas, limited vocabulary and grammar, and poor organization, and these problems can negatively affect students' writing (Sun, 2010; Walsh, 2010).

Within Vietnam, tests and observations show that writers struggle with simple paragraph structure, transitions, and lexical variation even at the high school level. As demonstrated by 11th graders at Ly Nam De High School, students relied heavily on teacher support or even online translation to write pieces that were disjointed and not original or coherent. Making a bad situation worse, these students' ability to write coherently in context must be taken up within another issue in Vietnam -- predominantly

grammar-translation methods in the teaching of EFL writing and little exposure to real, authentic communicative contexts.

The assimilation of artificial intelligence (AI) into education has received substantial advocacy throughout the past several years. AI applications in language learning may include automated feedback systems, intelligent tutoring, and adaptive learning platforms (Petersen, 2021). Due to improvements in natural language processing (NLP) and machine learning, AI now offers instantaneous personalized feedback on written and spoken language, thereby alleviating the instructors' workload and enhancing learner autonomy (Bouchaux, 2019).

AI tools for academic writing again provide a salient application for EFL contexts. Software programs such as Grammarly, ProWritingAid, and Writefull evaluate student writing in real time, offering suggestions regarding accuracy of grammar, vocabulary, coherence, and academic style. Research has revealed that these kinds of applications promote not only learner engagement, but also linguistic accuracy and support for students outside of the classroom (Mammadova, 2019; Chukharev-Hudilainen & Saricaoglu, 2016).

Nevertheless, the literature acknowledges cautions in using AI, simultaneously advocating for AI literacy and the use of AI to support, instead of isolating students from traditional means of instruction. The concern is that when too dependent on AI tools, students nuance their independent problem-solving and ability to take action as a critical thinker (Li, Link, & Hegelheimer, 2015). Additionally, issues can arise relative to AI tools' imposing limitations on students as a result of technological availability, compatibility, and/or the need for internet functionality.

Writefull is a tool to help with academic writing enhanced by artificial intelligence, which gives users feedback on grammar, vocabulary, and wording, and also provides access to databases of authentic language use (Writefull, 2020). Writefull, unlike other tools that are designed for use in more general contexts, such as Grammarly, is designed specifically for academic use. Additional features, such as database searches of published research texts and discipline-specific suggestions for useful vocabulary, make it an appropriate tool for support provided to students in complex, demanding tasks of writing for academic purposes.

Studies on Writefull show that it assists with improved accuracy, lexical sophistication, and overall quality of writing (Mammadova, 2019). Students also generally have a positive perception of Writefull due to its user-friendly interface and instant feedback provided (Petersen, 2021). Limitations of Writefull, amongst others, are inaccuracies in the use of the feedback, the need for the internet, and limited functionality when offline.

Research on Writefull in Vietnamese EFL classrooms is limited, and most studies have focused on Grammarly or other general writing assistants. Research into the role of Writefull in supporting high school students' paragraph writing allows a unique contribution to the literature.

International research has brought attention to the affordances of AI tools for supporting EFL writing development. Chukharev-Hudilainen and Saricaoglu (2016) examined automated feedback systems and found that the use of AI feedback provided learners with supportive and manageable writing roles and promoted grammatical accuracy and error reduction over time. Li et al. (2015) also found AI feedback tools to effectively complement teacher feedback and instructor writing instruction, with students being able to write for extended periods of time on a given writing task and track their own progress.

In Vietnam, Nguyen (2021) conducted research on an EFL writing class where learners made use of Grammarly and observed improvement in aspects of sentence structure and word choice; nevertheless, students relied upon the teacher more frequently for guidance in areas related to higher-order concerns of writing (e.g. argumentation and coherence). These conclusions were consistent with other international studies and writings on the use of AI and noted that AI feedback is most beneficial on lower-level language issues, whereas teacher feedback is more effective for higher-order concerns of writing.

3. Materials and Methods

3.1 Research design

The research presented herein drew upon an action research design to investigate the effect of Writefull on students' paragraph writing performance and perceptions of its utility. Action research seemed fitting because it allows teachers to investigate an immediate problem in their educational setting, take action in the classroom to address it, and describe the outcomes (Kemmis & McTaggart, 1988). The action research spiral of designing, acting, observing and reflecting allowed the researcher to bring Writefull into practice while observing its effects at the same time.

3.2 Participants

The participants of the study consisted of 30 students from Class 11A3 of Ly Nam De High School in Thai Nguyen province during the second semester of the 2023–2024 school year. The participants were between 16 to 17 years old and had mixed levels of proficiency in English, with the majority of students demonstrating below mid-level in writing performance, with performance levels determined through mid-term results. The participants were a purposive sample, as they were easy to access, and the teacher-researcher would be the instructor of the course.

3.3 Research instruments

In order to gather a rich body of data, three sources of information collection were utilized: first, to assess the students' paragraph writing ability before and after the intervention, two writing tests (pre-test and post-test) were developed. Both writing tests

were a short paragraph (150–180 words) on some familiar topics related to the school curriculum (i.e., Summer Fun or a Holiday), due to the students' personal relevance, although the writing task would change in order to maintain an unknown context. Both writing tests were assessed according to a writing rubric for paragraph writing adapted from the criteria of the Ministry of Education and Training (MOET) and included grammatical, vocabulary, organization and cohesive elements. Second, at the end of the intervention a questionnaire was administered to the students to gain insight about their perceptions of Writefull. The questionnaire consisted of closed-ended items utilizing the four-point Likert Scale (e.g. disagree to agree) and a series of open-ended questions where students could explore their experiences of Writefull more thoroughly. The closed-ended items focused on perceived usefulness for writing development, ease of use versus challenge, and areas of writing development, and the open-ended items were of a similar nature but provided students with the chance to explain their views in detail and provide further elaboration. Third, the teacher-researcher maintained classroom observation notes through the intervention, documenting engagement with Writefull, common challenges all students faced, and patterns in classroom engagement.

3.4 Procedures

The intervention was designed to take place over 10 weeks and was implemented in the structure of the specific stages of the action research cycle:

- **Planning:** Observational data and well-being test scores were analyzed to recognize student challenges in the area of writing. Writefull was chosen as the medium for intervention due to its ability to provide instant feedback on grammar, vocabulary, and organization.
- **Acting:** Students were shown how to access Writefull and were trained on how to use some of its basic functions. In writing lessons each week, students were told to draft paragraphs, access automated feedback from Writefull, and revise their paragraphs with this feedback in consideration. They were also offered teacher support if needed to clarify feedback or support students in making corrections.
- **Observing:** The researcher collected pre-test and post-test data, along with the questionnaire, and took notes regarding student attitudes and behavior during observations.
- **Reflecting:** The researcher analyzed the places where the intervention worked well or needed improvement, according to helping the teacher better understand how to teach writing.

3.5 Data analysis

Quantitative findings from the writing tests were analyzed by comparing the mean scores in grammar, vocabulary, coherence, and organization on the pre-test and post-test writing. A paired-samples t-test was used to ascertain whether the differences observed were statistically significant. Questionnaire responses were analysed descriptively,

employing percentage calculation to summarize students' attitudes towards Writefull. Qualitative data from open-ended responses written by students, and classroom observations were then coded thematically to add further insight to students' experiences.

4. Results and Discussion

4.1 Results

4.1.1 Students' writing performance

Table 1 shows the average means of students' pre-test and post-test scores on the four criteria: grammar, vocabulary, coherence, and organization.

Table 1: Comparison of Pre-test and Post-test Scores

Criterion	Pre-test Mean	Post-test Mean	Mean Difference	Sig. (p)
Grammar	3.10	5.20	+2.10	<.05
Vocabulary	3.30	5.40	+2.10	<.05
Coherence	3.00	5.00	+2.00	<.05
Organization	3.20	5.10	+1.90	<.05
Overall	12.60	20.70	+8.10	<.05

The findings suggest that students' writing performance demonstrated a significant level of improvement following the 10-week intervention with Writefull. The aspect of grammar and vocabulary had the greatest increases (+2.10 each), while coherence (+2.00) and organization (+1.90) were closely behind grammar and vocabulary. A paired-samples t-test found that improvement in these areas was statistically significant ($p < .05$).

4.1.2 Students' perceptions of Writefull

The questionnaire below illustrates information about the general positive attitudes toward Writefull.

Table 2: Student Perceptions of Writefull

Aspect	Percentage of Positive Responses
Writefull helped improve grammar	90%
Writefull enriched vocabulary	87%
Writefull enhanced coherence/organization	82%
Writefull was easy to use	85%
Writefull motivated independent learning	78%
Reported technical challenges (offline issues, compatibility)	40%

A considerable number of the students acknowledged Writefull as contributing to their enhancements in grammatical accuracy and vocabulary use. Plenty of students also reported that the quality of coherence and organization improved, and perhaps most impressively is that 85% of respondents found the tool to be user-friendly, while 78% said

it motivated them to write independently. On a cautionary note, when looking at the difficulties, almost 40% of the students reported some technical issues, particularly with needing to be online, and there were sometimes software incompatibility issues.

4.1.3 Classroom observations

Observational notes illustrated how students moved from dependence on teacher correction to more independence using Writefull feedback. Over the first few sessions of using Writefull, students continually asked the teacher to describe automated suggestions. By the final week of the intervention, there was visible confidence in most students as they revised their writing based on Writefull's suggestions. A handful of students still showed confusion when the suggestion was vague or when the suggestion had multiple options to choose from.

4.2 Discussion

The present study demonstrated that incorporating Writefull into an EFL writing course effectively improved learners' paragraph writing skills. The significant improvements in grammar and lexicon suggest that Writefull addressed lower-level linguistic features, such as in earlier studies that have demonstrated AI feedback systems can be effective for lower-level linguistic features (e.g. Chukharev-Hudilainen & Saricaoglu, 2016; Li et al., 2015). The improvements in coherence and organization might suggest that Writefull also contributed to higher-order writing skills, although it is noted that the teacher scaffolding likely played some support in students' understanding and application of the feedback. Students' positive views of Writefull add to the body of international research, which has shown that AI writing assistants generate motivation and engagement (e.g. Mammadova, 2019; Petersen, 2021). Students' particularly noted the immediate feedback that Writefull elicited, as the feedback provided students with a deeper understanding of identifying errors and how the feedback could help them correct their errors while drafting; however it is important to note the reported technical issues as limitations that deserve consideration for any possible implications for contexts with unstable internet connections or limited tech resources, such consideration may also arise in contexts where very basic tech resources or little access to tech resources might be available. The classroom observation data corroborate the questionnaire data, where students appeared to move their zone of engagement toward increased learner autonomy. This is also consistent with the broader aims of the 2018 General Education Program in Vietnam, which advocates for communicative competence and independent learning. However, there still remained some uncertainties that some students expressed about the recommendations and pushed the need for the teacher to be involved in the AI feedback, if for nothing else than to support critical judgment about evaluating to respond using the automated resources and to help students drive their own work in developing drafts. Overall, results indicate Writefull can be a useful adjunct to instruction in Vietnamese

EFL classrooms. There should also be a balance between tech support and anticipation, in which it promotes critical thinking and meaningful development of writing.

5. Recommendations

The study's findings resonate with numerous pedagogical and practical implications. For teaching professionals, it is advisable that Writefull is used as a supplementary tool associated with traditional instruction, not a stand-alone replacement. While Writefull offers a combination of rapid and actionable feedback on linguistic accuracy related to grammar and vocabulary, it does not provide the ability to address the more sophisticated concepts needed for composition, such as critical thinking and argumentation, and rhetoric and development. Teachers should model its use, providing students with initial training on acceptance of the feedback provided by Writefull, lowering the chances of mechanical use of the software.

In terms of student learning, it is important that students meaningfully engage and critically evaluate the changes suggested by Writefull. Students should perceive the assistance of the software as support rather than a warranted accuracy of authority. In understanding how to evaluate feedback suggestions, students will be developing independence and confidence as writers. In addition to a classroom assignment, having students assign their own self-study writing task with Writefull would be beneficial in supporting their consistency, practice, and long-term improvement in writing development.

At an administrative and policy level, having considered some practical pedagogical implications, there are issues with digital infrastructure that will need more resources for making technology a more tangible and accessible tool for the long-term incorporation of AI software such as Writefull. Students should have good, reliable, and efficient digital access, both connected to the Internet and updated digital devices, to provide the most valuable experience as they interact with the Writefull software. School leaders should provide staff professional development to ensure teachers are able to implement the software use within their pedagogy, when writing with technology is deemed acceptable. This will benefit the teacher, offer to raise teacher concerns about the new technologies, and respond to topical concerns across educational nations, and among providers, for innovation of technologies in education.

Future directions for research can build on these findings in this study on Writefull in student writing development through a longitudinal study. Connecting teacher pedagogical experience with students' writing outcomes can provide answers to whether improvements in grammar, vocabulary, coherence, and organization have been retained over subsequent studies. Future directions for extending the use of AI software would be to examine the results with even higher writing tasks, such as argumentative essays or academic reporting.

In all, this current study indicates that Writefull is a viable technological innovation for EFL writing instruction. If used collectively with teacher support and digital infrastructure, Writefull will add to the types of writing pedagogy to support accuracy, fluency, and learner autonomy for productive outcomes in writing contexts.

6. Conclusion

This research aimed to investigate the effectiveness of an AI-assisted writing tool, Writefull, in improving the paragraph writing abilities of 11th graders at Ly Nam De High School, Thai Nguyen province. The study used an action research design over 10 weeks with 30 participants. Data collection methods used were pre-tests, post-tests, questionnaires, and classroom observations to build a holistic understanding of the tool's effectiveness.

The results showed improvement in students' writing performance in four areas of focus: grammar, vocabulary, coherence, and organization. Two areas exhibited the most improvement, grammar and vocabulary, demonstrating Writefull's ability to provide immediate and accurate feedback on lower-level features of writing. There were also results in coherence and organization, showing that students' writing improved beyond just error correction to the logical and cohesive structuring of ideas.

In addition to performance, student perspectives of Writefull were largely positive. Most students reported that Writefull was easy to use, aided in their accuracy, and inspired them to attempt writing independently. There was, however, some frustration due to dependence on the internet and occasional difficulty with compatibility issues, highlighting the relevance of the technological infrastructure needed for the tool to be effective and the overall importance of teacher support.

In summary, Writefull provides a useful pedagogical support in pedagogical practice and use in Vietnamese EFL classrooms. The Ministry of Education and Training (MOET) 2018 General Education Program acknowledges communicative competence, learner autonomy, and the effectiveness of modern technologies in teaching and learning writing.

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Conflict of Interest Statement

The authors declare no conflicts of interest.

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