

Investigating EFL Students' Writing Problems Through the Lens of Grammarly

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Abstract—Writing is the most challenging skill for EFL students who are confronted with grammatical issues. Recently, automated writing evaluation (AWE) has been dramatically used in the EFL writing context. This study aims to analyse the types of writing errors composed by EFL students by using Grammarly as an AWE tool. The four main types of writing errors investigated in this study are correctness, clarity, engagement, and delivery. This study employed a qualitative design, including a document analysis of 27 EFL students' written productions before and after using Grammarly. The findings of this study revealed that grammatical correctness issues were primarily found in the form of ungrammatical sentences and incorrect phrasing, followed by engagement issues, namely word choice errors. However, misplaced words or phrases, comma misuse within clauses, and incorrect punctuations were found at a lower frequency. These findings are consistent with previous studies suggesting that Grammarly can improve grammatical accuracy and writing fluency. The conclusions of this study suggest using Grammarly as a supplementary tool in EFL writing classrooms, in addition to instructing students on how to use it effectively. The limitations of this study include a small sample size and the use of data collected from a single session, highlighting the need for further research in this area.

Index Terms—Grammarly, L2 writing, EFL students, corrective feedback, automated writing evaluation

I. INTRODUCTION

Writing is an essential skill that enables learners to convey their ideas through written productions. It is considered a necessary skill in English as a foreign language (EFL) (Jomaa & Jibroo, 2024). Writing competence is a crucial component of English proficiency assessment in higher education and a fundamental aspect of English curricula (Martine-Carrasco & Chabert, 2023). In writing activities, learners must be involved in multiple stages of writing, including planning, drafting, revising, and editing their written texts. During these writing processes, learners participate in the planning stage to generate and structure ideas relevant to the topic, the drafting stage to compose their ideas into a paragraph, the revising stage to review, analyse, and revise the draft, and the editing stage to refine based on the feedback received (Ramauthie & Aziz, 2022).

However, writing is the most challenging skill for second language (L2) writers (Prompan & Piamsai, 2024; Thangthong et al., 2024). To write in English, second language learners often encounter significant challenges related to fundamental language issues, primarily grammatical and syntactical inaccuracies. These may be manifested as improper verb usage, incorrect application of prepositions and articles, inconsistencies in tense, confusion between singular and plural forms, flawed sentence structure, and difficulties with colloquial expressions and spoken language (Mohammad, 2024). Many EFL learners find English writing difficult due to its cognitive and linguistic demands (Fan & Wang, 2024). Consequently, the communication skills of L2 writers are adversely impacted by these problematic writing challenges, which hinder their writing performance (Fan & Wang, 2024). Recently, many researchers proposed automated writing evaluation software (AWE) to enhance students' development of writing skills, such as Grammarly software (Martine-Carrasco & Chabert, 2023). This software is considered a grammar checker, as it provides instantaneous feedback and offers some metalinguistic explanations of grammatical errors (Martine-Carrasco & Chabert, 2023, p. 3). Thus, the current study aims to investigate EFL students' writing errors, including correctness, clarity, engagement, and delivery, by deploying the AWE software as the teacher's corrective feedback on the EFL students' written productions.

II. REVIEW OF LITERATURE

A. Written Corrective Feedback

Corrective feedback is a teacher's comment that "provides students with information on complex sentences and corrections to students' writing problems" (Tambunan et al., 2022, p. 17). Written corrective feedback from teachers is viewed as helpful in enhancing students' writing performance. Technological advancements in the digital era facilitate the provision of online corrective feedback in writing (Tambunan et al., 2022). Corrective feedback provides students with information regarding complex sentences and addresses their writing difficulties (Tambunan et al., 2022).

B. Grammarly as an AI Tool for Automated Writing Evaluation

Grammarly is viewed as a beneficial AI tool for enhancing writing skills and correcting grammatical errors in written work. According to Ebyary (2022), Grammarly is an automated writing evaluation tool that provides real-time feedback, highlighting errors as users compose their text. As an AWE tool, Grammarly detects issues in an uploaded text. It provides feedback on writing errors determined by six criteria: contextual spelling, grammar, punctuation, sentence structure, style, and vocabulary improvement (O'Neill & Russell, 2019). This AWE tool highlights problems on the left side of the screen, with proposed corrections displayed on the right side. The errors can be replaced by selecting the suggested change (O'Neill & Russell, 2019). In addition, Calma et al. (2022) highlighted the usefulness of Grammarly in detecting writing errors. The researcher also suggested that Grammarly can be used as a self-evaluation and feedback mechanism to improve students' writing. Calma et al. (2022) noted that although Grammarly is a beneficial resource for students seeking immediate feedback on their writing, it does not relieve instructors of their responsibility to foster students' writing abilities. Similarly, Llausas et al. (2024) confirmed that Grammarly can enhance ESL/EFL students' writing skills through its beneficial features, including error detection and correction, immediate and personalised feedback, user-friendliness and accessibility, and autonomous learning and confidence. In a pedagogical context, Grammarly is highly beneficial in providing statistics on the frequency of grammatical, lexical, or stylistic errors in a particular group of students (Zinkevich & Ledeneva, 2021). This AWE tool provides corrective feedback on grammar, vocabulary, and mechanics and checks for plagiarism while users compose their written work (Dizon & Gayed, 2024). In the digital era, Grammarly, an AI tool, is beneficial for students as it provides real-time corrective feedback, helping them improve grammatical issues in their written texts.

Grammarly is viewed as an automated writing evaluation (AWE) tool to enhance learners' L2 writing development (Ebyary, 2022; Dizon & Gold, 2023). Zhang (2021) critically evaluated AWE's advantages in terms of time and cost savings, practicality, and learner-centeredness. AWE systems enable learners to perform online self-assessments while engaging in writing activities, receive prompt feedback, and revise their writing tasks in an interactive cycle (Zhang, 2021). Moreover, AWE systems can facilitate learners' understanding of feedback, enable evaluative judgements for enhancement, and promote responsibility in their learning processes (Zhang, 2021). Dizon and Gold (2023) mentioned that AWE also enables learners to allocate less working memory to lower-level writing tasks (e.g., spelling, grammar, punctuation, translation), thereby allowing more time for higher-level tasks such as content and organization (p. 300). Grammarly, as an AWE tool in the L2 writing classroom, is associated with positive themes such as error correction, English improvement, metalinguistic awareness, enjoyment, ease of use, and increased confidence (Dizon & Gold, 2023). In addition, Grammarly offers error-flagging and real-time feedback on writing errors, underlining them as users compose the text (Ebyary, 2022). Regarding review suggestions in error flags, Grammarly provides feedback on four dimensions: correctness, clarity, engagement, and delivery. In the L2 writing context, Grammarly is designed to give automatic feedback on grammatical issues in English for ESL/EFL students (Martinez-Carrasco & Chabert, 2023, p. 7). Many researchers have investigated the effects of Grammarly, focusing on four dimensions: correctness, clarity, engagement, and delivery (see Table 1).

TABLE 1
GRAMMARLY'S DIMENSIONS AND SUB-DIMENSIONS FOR AUTOMATED WRITING EVALUATION

Grammarly dimensions	Focuses on Grammarly sub-dimensions	Previous studies
Correctness	• Punctuations in compound/ complex sentences, commas in clauses, determiner, subject-verb agreement, preposition error, spelling, convention	Bailey and Lee (2020)
	• Passive voice misuse, determiner use, punctuations in compound/complex sentences, comma misuse, wrong/missing propositions	Obsioma (2021)
	• Punctuation mistakes, misuse of articles, inconsistencies (spelling, numbers, dates, acronyms)	Zinkevich and Ledeneva (2021)
	• Conventions, grammar, punctuation, spelling	Calma, Cotronei-Baird, and Chia (2022)
	• Misuse of punctuations, determiner, comma misuse, wrong/missing preposition, confused words, verb tenses, pronoun use, misplaced words/phrases, spelling, incorrect noun number, incorrect phrasing, improper format, incomplete sentence, conjunction, subject-verb agreement, misuse of quantifiers/ modifiers, text consistency, unknown words, faulty parallelism	Martinez-Carrasco and Chabert (2023)
	• Grammar and spelling mistakes	Su, Qian, and Luo (2024)
Clarity	• Incomplete sentence, conciseness	Bailey and Lee (2020)
	• Unclear sentences, wordy sentences, intricate text, incorrect noun numbers, misspelt words	Obsioma (2021)
	• Wordy/long/complex sentences, overuse of subordinate clauses, overuse of passive voice, dangling modifiers, wrong linking words, unclear antecedents, non-parallel structure, overuse of prepositional phrases	Zinkevich and Ledeneva (2021)
	• Concision, readability, clarity	Calma, Cotronei-Baird, and Chia (2022)
	• Wordy sentence, passive voice misuse, unclear sentence, unclear paragraph, intricate text, hard-to-read text	Martinez-Carrasco and Chabert (2023)
	• Language clarity	Su, Qian, and Luo (2024)
Engagement	• Variety	Bailey and Lee (2020)
	• Word choice	Obsioma (2021)
	• Abuse of filler words, overuse of grammar expletives, redundant intensifiers, weak words/ hackneyed phrases, gender-neutral words	Zinkevich and Ledeneva (2021)
	• Variety, vocabulary, fluency	Calma, Cotronei-Baird, and Chia (2022)
	• Word choice	Martinez-Carrasco and Chabert (2023)
	• Accuracy of words	Su, Qian, and Luo (2024)
Delivery	• Formality, sensitivity	Calma, Cotronei-Baird, and Chia (2022)
	• Colloquialism, tone suggestion	Martinez-Carrasco and Chabert (2023)
	• Improving overall expression	Su, Qian, and Luo (2024)

C. Previous Studies on Using Grammarly' Feedback to Enhance L2 Writing Skills

Scholars have recently focused on investigating error categories using Grammarly to check and improve grammatical problems in the written productions of EFL students. Many researchers investigated the types of errors in L2 writing before and after using Grammarly (Ebyar, 2022; Dizon & Gayed, 2021; Jomaa & Jibroo, 2024; Sanosi, 2022). For example, Dizon and Gayed (2021) examined the impact of Grammarly on the quality of mobile L2 writing. They found that L2 students wrote with higher grammatical accuracy and lexical richness using the Grammarly keyboard. Grammarly assisted students in eliminating several grammatical errors, particularly frequent issues regarding verb tense and singular versus plural noun errors (Dizon & Gayed, 2021). In addition, Ebyary (2022) studied native and non-native speakers' reactions to Grammarly-flagged errors and revealed that both native and non-native writers accepted suggestions from Grammarly to improve their written texts. Most non-native speakers identified grammatical mistakes, including punctuation, spelling, word selection, passive voice, and tone (Ebyary, 2022). The researcher claimed that Grammarly-flagging tools were helpful and suggested integrating another technology, such as screen recording, to reflect on flagged errors and the revision moves students might make when responding to the flagged errors. Similarly, Sanosi (2022) studied the impact of Grammarly on EFL learners' academic writing accuracy and revealed that article usage errors were the most common errors made by the participants. After using Grammarly, errors in article usage, subject-verb agreement, and singular plural form were reduced. According to the study, the relative frequency of errors and corrective feedback helped students understand feedback and correction suggestions (Sanosi, 2022, p. 314). According to the study, the relative frequency of errors and corrective feedback helped students understand feedback and correction suggestions (Sanosi, 2022). By concentrating on corrective feedback from Grammarly, students are consistently presented with a particular corrective suggestion, which can enhance the learning process and establish a practice element (Sanosi, 2022).

Recently, Jomaa and Jibroo (2024) found that the free version of Grammarly can help students improve their spelling, use of synonyms, vocabulary, article writing, connecting ideas, error identification, and punctuation use. In this study, participants frequently utilized online resources to manage mistakes, as mistakes and corrections can facilitate their correct learning of a language (Jomaa & Jibroo, 2024). The researchers asserted that "Grammarly improves writing fluency by saving time composing ideas, resulting in more language input (Jomaa & Jibroo, 2024, p. 25). Despite these contributions, a significant gap remains in the literature regarding the impact of Grammarly use on the writing

development of EFL students and the implications of different student proficiencies on the frequency of writing errors. Furthermore, there has been little research into how Grammarly can enhance L2 writing development for EFL students in a Thai context. Therefore, this study aims to investigate the types of writing errors produced by EFL students and their attitudes towards using Grammarly to enhance their writing skills.

III. METHODOLOGY

A. Research Design

This current study employed a qualitative research design to answer the research question: What types of writing errors did Grammarly identify in 27 EFL students' written productions? This research design incorporates document analysis to analyse students' Grammarly review suggestion reports. To collect research data, the Grammarly reports of review suggestions from EFL students' L2 Writing were analysed to gain a deeper insight into their writing performance after using Grammarly as an automated writing evaluation tool. The duration of this study was a single session, during which writing samples were collected from EFL students. The study's one-time duration may not be a significant factor in the efficacy of Grammarly and did not have a substantial impact on writing quality (Zhai & Ma, 2023; as cited in Dizon & Gayed, 2024).

B. Participant Characteristics and Sampling Procedures

The population for data collection comprises second-year English language students enrolled in the Paragraph Writing course during the first semester of the 2024 academic year, totalling nine sections with 347 students. These 347 EFL students came from various majors, including English, Chinese, Japanese, French, and Thai, and included students from the duo program who were majoring in Chinese-English and French-English.

Purposive Sampling was used to recruit 27 students based on their issues with English writing and their limited experience using digital tools to enhance their L2 writing development. Initially, thirty-four students were recruited to participate in this study; however, only 27 students ultimately took part and signed the consent form. Seven students were excluded from participation in this study because they did not have access to the Grammarly application. Quantitative data were collected from Grammarly review suggestions from 27 students. For qualitative data collection, samples of written productions and samples of Grammarly review suggestions were gathered from six students, including the top three students with the highest English writing scores and three students who gained the lowest scores.

C. Writing Activities

Data were collected over four weeks in the Paragraph Writing classroom during Semester 1 of the 2024 academic year. In the first week, the researcher introduced the research project briefly and asked the participants to sign the consent form. The participants were informed that they could withdraw from the research project at any time.

In the second and third weeks, fourteen students participated in the paragraph writing activities. The students participated in L2 writing activities across three stages: pre-writing, while-writing, and post-writing. During the *pre-writing activity*, the students were given a mind map outline to brainstorm ideas for writing a paragraph. After brainstorming and planning ideas for writing, a paragraph writing outline was given to the students to organise their paragraph writing, including topic, topic sentence, supporting sentences, and concluding sentence. During the *while-writing stage*, the students were given 30 minutes to write their paragraphs, transforming their ideas from the mind map and the writing outline. In this stage, the students were scaffolded by the teacher and their peers to complete their paragraph writing task.

During the *post-writing activity*, the students were asked to self-correct their written text by using Grammarly as the AWE tool. The students uploaded their first draft of the written texts in the Microsoft Teams classroom, allowing the researcher to later identify their writing errors. After that, a Grammarly Premium account was provided to the students, enabling them to upload their written production, correct grammatical errors, paraphrase, and remove writing mistakes independently. Then, the students were asked to save the second draft of their writing using Grammarly and upload it to the Microsoft Teams class in the Paragraph Writing course. While using Grammarly to correct their written texts, students were asked to capture a screenshot to show the review suggestions from Grammarly and how they corrected their writing according to the suggestions.

Written text productions were assigned to the students entitled "Using Smartphones in the Classroom." The writing task included both the first version, before using Grammarly, and the second version, after using Grammarly. The students were asked to write a paragraph in two drafts: the first was non-Grammarly writing, and the second was revised after receiving a Grammarly feedback report. In other words, the first draft was the version they wrote independently, and the second was the version they corrected their writing using premium Grammarly. The students submitted both drafts via the Microsoft Team, the online classroom for the Paragraph Writing course. The lengths of their written paragraphs were approximately 100-150 words. To focus on grammatical errors, only errors found in Grammarly's writing condition were analysed. The collected written texts were assessed.

D. Written Reports From Grammarly's Automated Written Feedback

Before using Grammarly, the researcher introduced the students to Grammarly, an AWE tool to correct writing errors. This AWE application offers both free and premium plans, which can be installed on Windows, Chrome, iPhone, iPad, and Android devices. The students were asked to use Grammarly through their smartphones, tablets, or iPads to access the Grammarly application. Before starting the writing activities, the researcher instructed the participants to download, install, and use this application. The researcher then explained and provided examples of using Grammarly to identify and correct grammatical errors based on Grammarly's review suggestions on correctness, clarity, engagement, and delivery. While using Grammarly, participants could choose from three options to 'accept', 'rephrase', or 'dismiss' the review suggestions.

Written reports were compiled from the students' Grammarly reports in PDF format. To receive Grammarly's automated feedback, Grammarly's goals were set as follows: a "general" domain, an intent to "inform, describe, or tell a story," a "knowledgeable" audience, and a formality level of "neutral." After the students submitted their written texts via Microsoft Teams, the researcher uploaded these 27 written productions to the Grammarly website based on the specified goals. Then, the Grammarly PDF reports of 27 written texts were analysed based on four dimensions: correctness, clarity, engagement, and delivery. First, 'Correctness' provides feedback for reducing standard grammar, punctuation, and spelling communication errors. Second, 'Clarity' provides feedback for writing that is more concise, simpler, and easier to understand. Third, 'Engagement' provides feedback to anticipate readers' questions and concerns, helping writers focus their attention on the main point and suggesting ways to make their texts resonate more effectively with the audience. Lastly, 'Delivery' provides feedback for the right balance of politeness, formality, and friendliness.

E. Data Collection

The data was collected in 2024 from 27 students enrolled in a Paragraph Writing course. Data collecting procedures started after the students signed the consent form. The duration of this study was a one-time session of four hours. The one session of data collection from Grammarly was appropriate for this study. Dizon and Gayed (2024, p. 10) stated that "study duration may not be an influential factor in the efficacy of Grammarly". Similarly, Zhai and Ma (2022; as cited in Dizon & Gayed, 2024) also stated that "intervention duration ... did not moderate the effect of AWE on writing quality".

The data collection procedures were as follows. First, the EFL students' written texts were collected by handwriting in the Paragraph Writing classroom. These written texts were collected during the tenth week, following the completion of the student's midterm examinations. The students were assigned to plan, organise, and write a paragraph of about 150 words. The Grammarly software was used for one hour before submitting the complete writing draft. Second, the students' written texts were analysed errors issues by Grammarly Premium's four writing errors to identify four main dimensions of writing errors: (1) Correctness, (2) Clarity, (3) Engagement, and (4) Delivery. Using Grammarly's writing issues identifications, 27 written texts were chosen to analyse their writing errors. At this stage, Grammarly Premium was used by the students to review their writing errors, which were flagged in the review suggestion sidebar of the Grammarly web page. Third, Grammarly's review suggestion sidebar was utilized to correct errors in the writing of EFL students. The students could click 'accept' or 'dismiss' Grammarly's review suggestions while correcting their writing errors. During this third stage, students were asked to send their final written productions after using Grammarly, capture each correction process, and complete the writing correction. Finally, the researcher downloaded the PDF reports of the students' written texts from the Grammarly website, classified error types, and analysed and quantified the number of errors in the EFL students' written texts.

F. Data Analysis

Error analysis, as contributed by Gass and Selinker (2008), was used to analyse the written productions of the EFL students. The four steps of error analysis included data collection, identification, classification, and quantification of errors in written texts composed by 27 EFL students. After collecting written texts in a one-time session, the errors in the written text derived from Grammarly's review suggestions were identified into four main issues: correctness, clarity, engagement, and delivery. In this classification step, the EFL students' grammatical errors in four issues (correctness, clarity, engagement, and delivery) were assessed by two raters: the researcher and a university lecturer. Two raters assessed the students' grammatical errors according to two criteria: that they were treatable grammatical errors and that Grammarly's review suggestions were clear and correct. Finally, the errors in the written text were counted to investigate which errors affected the EFL students' writing performance.

IV. RESULTS

The EFL students' writing errors were identified by using Grammarly Premium according to four domains: (1) correctness, (2) clarity, (3) engagement, and (4) delivery. Table 2 shows the number of writing issues from 27 written texts identified and classified by using Grammarly.

TABLE 2
EFL STUDENTS' FOUR TYPES OF WRITING ERRORS

Types of errors	Description (Grammarly, 2024)	Number of errors	Percentage of errors
Correctness	• Suggestions about spelling, grammar, and punctuation are underlined in red.	195	67.71 %
Clarity	• Suggestions for making writing easier to understand are underlined in blue.	36	12.50 %
Engagement	• Suggestions for making writing more fun to read, such as word choice improvements.	28	9.72 %
Delivery	• Suggestions to help writers craft their message with the appropriate tone and attitude.	29	10.07 %
Total		288	100%

Table 2 presents the writing errors identified by the EFL student using Grammarly Premium's PDF report version, totalling 288 errors. Correctness issues represented the highest number of errors, at 195 errors (67.71%), followed by clarity issues, with 36 errors (12.50%), and delivery issues, with 29 errors (10.07%). However, engagement issues were identified as the lowest number of errors, at 28 errors (9.72%).

Table 3 presents a further analysis of the EFL students' writing errors. The correctness issues were classified into three sub-dimensions in terms of grammar, punctuation, and spelling. Three sub-dimensions regarding clarity issues were identified: wordy sentences, unclear sentences, and intricate texts. In addition, the delivery issues were analysed regarding tone suggestions, inappropriate colloquialisms, and incomplete sentences. Finally, engagement issues were primarily focused on word choice (see Table 3).

TABLE 3
EFL STUDENTS' WRITING ERRORS AND SUB-DIMENSIONS

Correctness issues (195 errors)			Clarity issues (36 errors)		
Correctness: Grammar (149 errors)	Number of errors	Correctness: Punctuation and other (26 errors)	Number of errors		Number of errors
• Ungrammatical sentence (H)	62	• Improper formatting	14	• Wordy sentence	17
• Incorrect phrasing (M)	27	• Punctuation in compound sentences	8	• Unclear sentence	12
• Determiner misuse	14	• Closing punctuation	2	• Intricate text	7
• Incorrect noun number	11	• Comma misuse within clauses (H)	1		
• Incomplete sentences	8	• Incorrect punctuation	1	Delivery issues (29 errors)	
• Wrong or missing preposition	7	Correctness: Spelling (20 errors)		• Tone suggestion	12
• Incorrect verb form	5	• Confused words	13	• Inappropriate colloquialism	7
• Pronoun use	5	• Misspelled words	7	• Incomplete sentences	9
• Conjunction use	4				
• Misuse of modifiers	2			Engagement issues (28)	
• Misplaced words/ phrases (L)	1			• Word choice (L)	28
				Total of writing errors	288 errors

Table 3 presents the EFL students' writing errors, totalling 288 errors identified by Grammarly Premium across four domains: correctness, clarity, engagement, and delivery. The Correctness issues were identified as the highest number of errors in EFL students' writing, totalling 195 errors. Regarding the first sub-dimension of the correctness issue, grammatical errors were the most prominent, accounting for 149 errors, including the most problematic issues of ungrammatical sentences (62 errors). In addition, incorrect phrasing (27 errors) and determiner misuse (14 errors) were uncovered in the EFL students' grammatical problems in constructing English sentences. The second sub-dimension related to correctness issues included punctuation and other errors (26 errors), and the third sub-domain was spelling, where 20 errors were identified.

Regarding Clarity issues, the writing errors detected in the EFL students' writing were 36 errors. The predominant clarity issues were wordy sentences (17 errors), unclear sentences (12 errors), and intricate text (7 errors). For Delivery issues, a total of 29 errors were identified. These results indicated that the EFL students' writing was marked by errors in tone suggestions (12 errors), inappropriate colloquialisms (7 errors), and incomplete sentences (9 errors). Lastly, Engagement issues were identified as 28 word-choice errors, revealing that EFL students selected inappropriate vocabulary in their written texts.

Table 4 presents examples of Grammarly Premium's review suggestions for EFL students' grammatical correctness issues. The review suggestions highlighted correctness issues in grammar, punctuation, and spelling errors. In Table 3 below, pre-Grammarly feedback corrections, review suggestions, and post-Grammarly feedback corrections for correctness issues were illustrated.

TABLE 4
EFL STUDENTS' WRITING SAMPLES BEFORE AND AFTER USING GRAMMARLY: CORRECTNESS ISSUES

Sub-dimensions of correctness issues	Examples of EFL students' writing errors	Grammarly's review suggestions	Post-Grammarly feedback corrections
Grammar Errors			
• Ungrammatical sentences (US)	• "There are many benefits <u>for</u> using <u>smartphone</u> in <u>classroom</u> ." (S1-US)	• Correct the sentence	➔ There are many benefits <u>to</u> using <u>smartphones</u> in <u>the</u> classroom.
• Incorrect phrasing (IP)	• "Therefore, using smartphones in the classroom <u>helps in learning</u> in the classroom." (S29-IP)	• Rephrase	➔ Therefore, using smartphones in the classroom <u>helps</u> learning.
• Determiner use (DU)	• "And using <u>smartphone</u> in <u>classroom</u> can save time to studying English." (S1-DU)	• Correct article usage • Add an article	➔ And using <u>a</u> smartphone in <u>the</u> classroom can save time in studying English.
• Incorrect noun number (INN)	• "And we also have some <u>game</u> that we can practice English." (S1-INN)	• Fix the agreement mistake	➔ And we also have some <u>games</u> that we can practice English. (S11-INN)
• Incomplete sentences (IS)	• "You can also use various applications on you smartphone to <u>help</u> with learning. <u>such</u> as using Quiz apps to <u>help practice</u> taking exams or YouTube apps for us <u>in studying</u> various online lessons." (S29-IS)	• Rewrite the sentence	➔ ..., such as using Quiz apps to help <u>us</u> practice taking exams or YouTube apps for us <u>in studying to study</u> various online lessons.
• Wrong or missing preposition (WMP)	• "Some students can <u>listen</u> words and practice pronunciation." (S8-WMP)	• Add the preposition	• Some students can <u>listen to</u> words and practice pronunciation.
Punctuation and other errors			
• Punctuation in compound or complex sentences (PCS)	• "Especially because in today's era <u>where</u> technology plays an increasingly important role in society." (S29-PCS)	• Add a comma	➔ Especially because in today's era, <u>where</u> technology plays an increasingly important role in society.
• Improper formatting (IF)	• "I will do the tests from the internet. <u>the</u> application that I like to use for learning languages." (S7-IF)	• Capitalize the word	➔ <u>The</u> application that I like to use for learning languages.
Spelling Errors			
• Confused words (CW)	• "such as using it to record images of what the teacher teaches to take <u>bake</u> to review the lesson." (S29-CW)	• Correct your spelling	➔ such as using it to record images of what the teacher teaches to take <u>back</u> to review the lesson.
• Misspelled words (MW)	• "... and I learned <u>chinese</u> and English from an application named "Duolingo"." (S7-MW)	• Change the capitalization	➔ "... and learned <u>Chinese</u> and English from an application named "Duolingo".

Table 4 presents examples of the EFL students' writing corrective issues related to grammar, punctuation, and spelling errors. Regarding examples of grammar errors at a sentence level (e.g. S1-US, S29-IP, S29-IS) which were the most critical writing problems of the EFL students, Grammarly provided review suggestions for these corrective errors of grammar to correct the sentence, rephrase, and rewrite the sentence. Regarding punctuation and other errors (S29-PCS, S7-IF), Grammarly flagged a review suggestion to correct this writing error by adding a comma and capitalising the word. Regarding spelling errors (S29-CW, S7-MW), Grammarly's review suggested correcting spelling and changing the capitalization.

Table 5 below presents examples of EFL students' writing with clarity errors detected by Grammarly. The identified clarity issues included wordy sentences, unclear sentences, and intricate texts. Using Grammarly to check grammar after writing, review suggestions and feedback corrections were flagged, and examples were given for the EFL students to accept or dismiss the review suggestions.

TABLE 5
EFL STUDENTS' WRITING SAMPLES BEFORE AND AFTER USING GRAMMARLY: CLARITY ISSUES

Sub-dimensions of clarity issues	Examples of EFL students' writing errors	Grammarly's review suggestions	Post-Grammarly feedback corrections
• Wordy sentence (WS)	• " <u>To start with</u> , using smartphones can help students learn vocabulary in the classroom." (S8-WS)	• Change the wording	➔ <u>To start with, First</u> , using smartphones can help students learn vocabulary in the classroom.
• Unclear sentence (US)	• "Lastly, <u>These day, There are a lot of resources available to use for learning</u> languages, which can help us become more proficient." (S1-US)	• Rewrite for clarity	➔ Lastly, These <u>day, There are a lot of resources available to use for learning days, many resources are available to learn</u> languages, which can help us become more proficient.
• Intricate text (IT)	• "In conclusion, using smart phone can help me to improve my language skills." (S7-IT)	• Start a new paragraph	➔ "Every sentence in a paragraph should relate to a single topic. If your paragraph get too long, it may mean that your're trying to explain too many ideas at once. Start a new paragraph whenever you move on to a new idea or a new stage of your argument".

Table 5 presents clarity issues identified in the written texts of EFL students. These clarity issues included wordy sentences (S8-WS), unclear sentences (S1-US), and intricate texts (S7-IT). For wordy sentences, Grammarly provided

review suggestions for changing the wording. Grammarly alerted and flagged review suggestions to rewrite for clarity regarding unclear sentences. In terms of intricate texts, Grammarly suggests that EFL writers start a new paragraph when the paragraph is too long and contains too many ideas.

Table 6 below reveals engagement issues faced by EFL students who used the exact English words. The review suggestion for engagement issues is shown in the table below.

TABLE 6
EFL STUDENTS' WRITING SAMPLES BEFORE AND AFTER USING GRAMMARLY: ENGAGEMENT ISSUES

Engagement issues	Pre-Grammarly versions	Grammarly's review suggestions	Post-Grammarly feedback corrections
• Word choice (WC)	• <i>“Especially</i> because in today's era where technology plays an increasingly important role in society.” (S29-WC)	• Choose a different word	→ <i>Mainly</i> because in today's era where technology plays an increasingly important role in society.

According to Table 6, engagement issues detected in the EFL students' writing were word choice errors (S29-WC). Grammarly's review suggestions were choosing a different word for the corrective feedback. For example, the EFL writer used the word 'especially', and the word 'mainly' was given as another word choice.

TABLE 7
EFL STUDENTS' WRITING SAMPLES BEFORE AND AFTER USING GRAMMARLY: DELIVERY ISSUES

Sub-dimensions of delivery issues	Pre-Grammarly versions	Grammarly's review suggestions	Post-Grammarly feedback corrections
• Tone suggestion	• “Secondly, we can get more <i>information that we do not understand</i> without having to ask the teacher.” (L1-TG)	• Adjust tone may improve connections	→ Secondly, we can get more <i>information that we need help understanding</i> without having to ask the teacher.
• Inappropriate colloquialism	• “ <i>And</i> to using Smart Phones for work. Use smart Phones to find unfamiliar vocabulary, such as app Longdo Dict.” (S21-IC)	• Replace the conjunction	→ <i>Moreover</i> , to using Smart Phones for work. Use smart Phones to find unfamiliar vocabulary, such as app Longdo Dict.
• Incomplete sentences	“These day, There are a lot of resources available to use for learning languages, which can help us become <i>more proficient</i> .” (L1-IS)	• Rewrite incomplete comparison	→ “These day, There are a lot of resources available to use for learning languages, which can help us become <i>more proficient</i> .”

Table 7 presents evidence of writing errors in delivery issues, including tone suggestions, inappropriate colloquialisms, and incomplete sentences. Grammarly's review suggestions for writing tone problem (L1-TG) was adjusting tone to improve connections. An inappropriate conjunction caused the EFL student's writing error of inappropriate colloquialism (S21-IC), so the review suggestion replaced the conjunction. Lastly, incomplete sentences (L1-IS) were detected in the EFL students' writing, as the sentences included incomplete comparisons. The review suggestion for incomplete sentences was rewriting incomplete comparisons.

V. DISCUSSION

It has been demonstrated that Grammarly identified errors in the writing of EFL students, specifically in terms of correctness, clarity, delivery, and engagement. Ungrammatical sentences were mainly found in the EFL students' written text for the correctness error types. Additionally, inappropriate word choices and wordy sentences also impacted the engagement and clarity of their written text. These findings are in accordance with the findings of Guba et al. (2024), who claimed that “using Grammarly to improve writing skills is beneficial not only to high-level students but also to low-level students in improving complex grammatical aspects such as using words and their forms properly” (p. 12). In addition, Calma et al. (2022) viewed Grammarly as a form of commentary support for enhancing high-quality writing, conveying and embedding writing expectations in assessments and promoting self-directed evaluation and action for writing development.

This study reveals that correctness is Grammarly's most prevalent writing error in EFL students' written productions. According to Martinez-Carrasco and Chabert (2023), these grammatical errors regarding sentence fragments, unclear sentence construction, and run-on sentences are considered critical errors in the text. This finding supports the finding of Promsupa et al. (2017), which uncovered that Thai EFL students struggled with writing English and produced grammatical errors at the sentence level. The researchers mentioned that writing with ungrammatical sentences may be because “differences between Thai and English structures could confuse the students to make errors in their English writing” (Promsupa et al., 2017, p. 101). In addition, the EFL students over-generalized the English structures because some English grammatical rules were difficult and complex. Hence, they used their learned English structures to apply new sentences inappropriately (Promsupa et al., 2017, p. 102).

Regarding clarity issues, the finding showed that most EFL students wrote their texts using wordy sentences. This finding aligns with Zinkevich and Ledeneva's (2021) research, which found that clarity problems occur when students use wordy, lengthy, and complex sentences that obscure meaning. The researchers noted that this clarity problem arises when students use wordy, lengthy, and complex sentences, as well as when subordinate clauses and the passive voice

are overused. Similarly, Martinez-Carrasco and Chabert (2023) also revealed that wordy sentence issues were the most frequent errors made by the participants. The researchers explain that wordy sentence errors were made “to raise the register of the text; students at the most advanced levels tend to expand and amplify structures”.

For the delivery issues, the tone suggestions were mainly flagged in this issue. This finding supports the findings of Zinkevich and Ledeneva (2021), which revealed how the students made delivery errors by writing their sentences in inappropriate tones. The researchers explained that students were unfamiliar with English understatement and cultural-loaded words and phrases. Consequently, “improper use of the culturally conditioned word may result in a misunderstanding in cross-cultural communication” (Zinkevich & Ledeneva, 2021, p. 61).

Lastly, the findings also revealed engagement issues related to word choice errors produced by the EFL students. The students used weak words or hackneyed phrases; as a result, they received suggestions and feedback to choose more effective words or synonyms. According to Zinkevich and Ledeneva (2021, p. 60), review suggestions on these word choice errors can make their writing more engaging, focused, and enjoyable. This finding also supports the findings of Bailey and Lee (2020), who studied Grammarly in a language-learning context and found that students borrowed language from textbooks and essay questions. These word choice errors reflected that non-native English-speaking university students require paraphrasing skills (Bailey & Lee, 2020).

VI. CONCLUSION

This study aims to investigate grammatical errors detected by Grammarly, an automated writing evaluation tool. The main finding is that correctness issues were the most frequent errors in the EFL students’ written production, specifically concerning ungrammatical sentences and incorrect phrasing. Additionally, the engagement issues involving word choice errors were more prevalent than other writing errors. However, misplaced words or phrases, comma misuse within clauses, and incorrect punctuation were the least frequent among other writing errors. These findings support the previous study’s findings that Grammarly enhances EFL students’ writing skills and helps prevent grammatical errors in their written texts.

The findings of this study provide implications for using Grammarly as an AWE tool in EFL writing classrooms. First, online corrective feedback software, such as Grammarly, should be used to enhance students’ writing skills. Before the writing process, students should be trained to utilise automatic corrective feedback to address their grammatical and vocabulary issues. As Rababah and Talafha (2024) mentioned, “Grammarly improves language abilities when used alongside specific grammar and vocabulary teaching” (p. 1491). Therefore, EFL teachers should routinely analyze students’ writing, offer comments on areas for growth, and promote the use of Grammarly for self-assessment and correction (Rababah & Talafha, 2024). Grammarly should be a supplementary resource in writing curricula rather than replace traditional instruction methods (Llausas et al., 2024). In addition, since using Grammarly in the writing classroom is related to students’ successful revisions, teachers could use Grammarly as a supportive tool in writing class regularly or encourage students to use this AWE independently (Thi & Nikolove, 2022, p. 776). Importantly, language teachers should provide adequate training on how to use Grammarly effectively by explaining its basic features, informing students about its affordances and limitations, and encouraging the use of this tool in the revision stage to foster metalinguistic awareness (Dizon & Gold, 2023).

However, this study has some limitations. First, the sample size was small, including 27 EFL students. Research data from a small number of participants, collected using the purposive sampling method, were gathered in a single classroom, which may raise concerns about generalizability. Further studies could be conducted with a bigger sample size to ensure the generalizability of the research.

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REFERENCES

- [1] Bailey, D., & Lee, A. R. (2020). An explanatory study of Grammarly in the language learning context: An analysis of test-based, textbook-based and Facebook corpora. *TESOL International Journal*, 15(2), 4-24.
- [2] Calma, A., Cotronei-Baird, V., & Chia, A. (2022). Grammarly: An instrumental intervention for writing enhancement in management education. *The International Journal of Management Education*, 20(2022), 1-11.
- [3] Dizon, G., & Gayed, J. M. (2021). Examining the impact of Grammarly on the quality of mobile L2 writing. *The JALT CALL Journal*, 17(2), 74-92.
- [4] Dizon, G., & Gayed, J. M. (2024). A systematic review of Grammarly in L2 English writing contexts. *Cogent Education*, 11(1), 1-14.
- [5] Dizon, G., & Gold, J. (2023). Exploring the effects of Grammarly on EFL students’ foreign language anxiety and learner autonomy. *The JALT CALL Journal*, 19(3), 299-316.
- [6] Ebyary, K. E. (2022). Native and non-native speakers’ reactions to Grammarly-flagged errors: Implications for L2 teaching of writing. *Electronic Journal of Foreign Language Teaching (e-FLT)*, 19(2), 113-129.
- [7] Fan, C., & Wang, J. (2024). Configurational impact of the self-regulated writing strategy, writing anxiety, and perceived writing difficulty on EFL writing performance: a fsQCA approach. *Scientific Reports*, 14(1), 1-15.

- [8] Gass, S., & Selinker, L. (2008). *Second language acquisition: An introductory course* (2nd ed.). New York: Routledge.
- [9] Guba, M. N. A., Awad, A., & Qub, A. A. (2024). 14(3). *World Journal of English Language*, 14(3), 1-13.
- [10] Jomaa, N., & Jibroo, H. (2024). Corrective feedback of Grammarly in enhancing L2 writing by EFL Kurdish students. *Bulletin of Advanced English Studies (BAES)*, 9(1), 1-15.
- [11] Llausas, S. M., Ruiz, E., Ayyican, S. M., & Evardo Jr., O. J. (2024). A systematic literature review on the use of Grammarly in improving the writing skills of ESL/EFL students. *International Journal of Multidisciplinary: Applied Business and Education Research*, 5(9), 3507-3516.
- [12] Martinez-Carrasco, R., & Chabert, A. (2023). Writing on steroids? Accuracy of automatic corrective feedback in L2 competence development. *Bellaterra Journal of Teaching & Learning Language & Literature*, 16(3), 1-25.
- [13] Mohammad, T. (2024). Challenging traditional EFL writing classroom using AI mediated tool: A paradigm shift. *World Journal of English Language*, 14(2), 211-219.
- [14] Obsioma, R. B. (2021). Utilizing automated written communicative feedback in the language learning context: An analysis of the Grammarly results of ESL researchers' conference abstracts. *International Peer Review Journal*, 15, 40-52.
- [15] O'Neill, R., & Russell, A. M. T. (2019). Grammarly: Help or hindrance? Academic learning advisors' perceptions of an online grammar checker. *Journal of Academic Language & Learning*, 13(1), A88-A107.
- [16] Prompan, J., & Piamsai, C. (2024). The Effects of Peer Feedback and Self-Regulated Learning on Thai EFL Students' Writing Ability and Self-Regulation. *LEARN Journal: Language Education and Acquisition Research Network*, 17(1), 100-132.
- [17] Promsupa, P., Varasarin, P., & Brudhiprabha, P. (2017). An analysis of grammatical errors in English writing of Thai university students. *HRD Journal*, 8(1), 93-104.
- [18] Rababah, L. M., & Talafah, D. M. (2024). Unlocking writing potential: Assessing the impact of Grammarly on Jordanian EFL students' writing proficiency. *Theory and Practice in Language Studies*, 4(5), 1486-1492.
- [19] Ramamuthie, V., & Aziz, A. A. (2022). Systematic Review: The Effectiveness of Digital Tools to Improve Writing Skill of ESL Students. *International Journal of Academic Research in Business and Social Sciences*, 12(3), 408-427.
- [20] Sanosi, A. B. (2022). The impact of automated written corrective feedback on EFL learners' academic writing accuracy. *The Journal of Teaching English for Specific and Academic Purposes*, 10(2), 301-317.
- [21] Su, Y., Qian, J., & Luo, M. (2024). A correlation study of automated writing evaluation system (Grammarly) and Chinese EFL learners' writing self-efficacy in their self-regulated learning. *Journal of Electrical Systems*, 20(3), 1874-1895.
- [22] Tambunan, A. R. S., Andayani, W., Sari, W. S., & Lubis, F. K. (2022). Investigating EFL students' linguistic problems using Grammarly as automated writing evaluation feedback. *Indonesian Journal of Applied Linguistics*, 12(1), 16-27.
- [23] Thangthong, P., Phiromsombut, J., & Imsa-ard, P. (2024). Navigating AI writing assistance tools: Unveiling the insights of Thai EFL learners. *THAITESOL JOURNAL*, 37(1), 111-131.
- [24] Thi, N. K., & Nikolov, M. (2022). How teacher and Grammarly feedback complement one another in Myanmar EFL students' writing. *Asia-Pacific Edu Res*, 31(6), 767-79.
- [25] Zhang, S. (2021). Review of automated writing evaluation systems. *Journal of China Computer-Assisted Language Learning*, 1(1), 170-176.
- [26] Zinkevich, N. A., & Ledeneva, T. V. (2021). Using Grammarly to enhance students' academic writing skills. *Professional Discourse & Communication*, 3(4), 51-63.



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