



Assessing Writing Abilities using AI-Powered Writing Evaluations

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Abstract

This study aims to investigate the effectiveness of AI software, Automated Writing Evaluation (AWE), in identifying grammatical errors and increasing writing abilities among Malaysian public university students, as well as their perspectives on AI software in enhancing writing skills. The outcomes of this study reveal that students have good attitudes toward the implementation of AWE. The findings have implications for using artificial intelligence (AI) software (AWE) in ESL writing classes. Moreover, future scholars are anticipated to do similar research to increase the effect and relevance of this work.

Keywords: Artificial Intelligence; Automated Writing Evaluation; Writing Skills; Technology

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1.0 Introduction

One of the most important goals of artificial intelligence is to develop automated devices that can comprehend their surroundings and carry out responsibilities in the same manner that people do. An automated device that can simulate human cognitive processes such as learning, reasoning, and self-correction falls under the broader category known as artificial intelligence (AI) (Popenici & Kerr, 2017). Artificial intelligence (AI), made possible by recent advances in technology, has made it possible for instructors to provide their students with new learning and teaching opportunities in assessment, tutoring, content production, and feedback. The new writing programmes being amalgamated to supply the Grammarly features in a single integrated application have the potential to make changes to the writing curriculum that are both flexible and time-saving (Koltovskaia, 2020).

Formative feedback and assessment are two of the most significant contributions digital writing tools have made to the writing process. Writing in English as a Second Language (ESL) requires careful attention to various linguistic elements, including spelling, punctuation, and grammar (Perdana & Farida, 2019). ESL students may benefit from the new AI Apps' comprehensive instructional practice component and its plagiarism detection component, both of which are designed to assist them in developing their research writing skills (Zawacki-Richter et al., 2019). While writing and concluding an English phrase or essay, learners or students of English as a Second Language (ESL) may need to correct several aspects of writing, such as spelling, punctuation, and grammar (Fitria, 2020a). The students know they have made a mistake after it was unintentionally done (Fitria, 2018). Spelling accurately relies on carefully selecting and placing the letters that comprise a word since spelling is defined as "the art of correctly combining letters to construct a word" (Fitria, 2020b, p. 4). In written communication, punctuation refers to a particular punctuation mark, and each type of punctuation and symbol has a distinct function. According to Mammadova (2019, page 54), using online grammar and spelling checker software is an essential component of teaching and learning the English language.

This resource is used when additional teaching materials for a language are required, i.e. when instructors need help finding what they need in other printed or online resources. It is also used when other language teaching materials are unavailable. According to Bouchoux (2019, page 545), there are several straightforward and cost-free tools available to users that can assist them in improving their written English. One such is the Grammarly website. You may try out Grammarly at <https://www.grammarly.com/>, where it is also accessible for usage. Grammarly identifies and corrects various errors, including grammar, spelling, and punctuation, in the user's work. Users can download the free browser extension offered by Grammarly or Grammarly for Microsoft Office. The premium version of Grammarly is available without cost to users. Writing is a complicated ability to master (Maharani, 2018). It is supported by statements such as "writing is such a difficult endeavour that needs a great deal of cognitive and language ability." (Faller, 2018; Maharani, 2018). ESL university students may need to correct a few aspects of writing, such as spelling, sentence structure, and accentuation, when writing and concluding an English expression or exposition (Fitria, 2020a). The students are unaware that they have

made a mistake at the very moment that it has been done, which is an interesting coincidence (Fitria, 2018). The ability to correctly put together individual letters to form words is known as spelling. Also, along similar lines, it is connected to the precise selection and strategic placement of letters that make up the structure of a word (Fitria, 2020b). Writing, spelling, and accentuation in English as a Second Language (ESL) all include syntax as a component of semantics (Perdana & Farida, 2019). The following are some of the research objectives:

1. To determine the student's perception of writing self-proficiency before and after the intervention session.
2. To identify students' expectations about using AWE in their writing learning process.

2.0 Literature Review

2.1 Writing Skills

Educators at all levels have placed a significant emphasis on developing students' writing abilities, particularly in the context of the English language. Writing skills demand great attention and focus from educators and learners since communication is expanding and is no longer limited to speaking alone (Naim et al., 2020). When put onto paper, a concept or message can go beyond a specific period and to an unlimited number of individuals (Ab Wahid et al., 2020). Think about how written texts might be found even if the task was done a thousand years ago and how it could be done. Writing served as the medium for accurately documenting history, events, cultures, and records. Hence, the investigation of writing abilities is a component of the efforts made to identify writing teaching and learning difficulties and provide recommendations and solutions to those challenges.

The act of writing is a challenging endeavour. Zali et al.(2022) stated that it requires careful attention and an understanding of the language being written. Maharani (2018) noted that the skill of writing is a challenging one. Furthermore, Faller (2018) assumes it needs considerable cognitive and linguistic talents. Writing is challenging for people who are fluent in the language they are using, but it is even more challenging for those learning English as a second language (Rahman et al., 2022). Yang (2013) observed that their shortcomings, improper language learning methods, and lack of understanding of formal writing practices had impeded their ability to produce a decent piece of writing.

Consequently, being good at writing requires close collaboration between the students and the instructors. The aim is to help them achieve the same goal of producing an excellent piece of writing utilising suitable writing procedures. Putting together a great team takes time and effort (Rahman et al., 2020). That requires a lot of time and work. In addition, the technique could be more precise because it differs from case to case (Lim & Phua, 2019). Students learning English as a second language struggles with issues related to genre, structure, and meaning (Rahman et al., 2015). The most common error, which is usually written off as an oversight, involves spelling words (Fitria, 2018). One challenge leads to

another as spelling affects meaning, resulting in writing that cannot express what it is supposed to say (Perdana & Farida, 2019). As a result of the shift to online distribution, several online technologies are currently being employed for education.

2.2 Automated Writing Evaluation (AWE)

The Covid-19 outbreak has impacted the worldwide teaching and learning landscape, shifting from physical to online. Ibrahim et al. (2022) state that the higher education institution began implementing the e-learning system to start teaching and learning with the university student. As a result of the shift to online distribution, several online technologies are currently being employed for education (Mohammad et al., 2023). It is necessary to evaluate the success of online learning to discover areas for improvement and aspects like instructor and student satisfaction (Baharuddin et al., 2022). Most Malaysian higher education institutions need help to embrace online distance learning (Sarkam et al., 2022). Writing classes are among those affected.

Automatic Writing Evaluation (AWE) software may analyse writing faults and provide rapid feedback in the battle to improve writing abilities. AWE software is becoming increasingly popular for analysing written texts in several ways, such as word selection, recommended phrases, grammatical correction, and even writing styles. According to Agustin and Wulandari (2022), one of the essential functions of AWE is to check the text structures in English and to provide alternative styles. However, the user is free to choose whether to accept or decline the suggestion provided to them.

When it comes to writing correction, AWE software is a valuable tool for both educators and students since it can analyse students' ESL writing in teaching and learning. AWE software can only partially replace instructor assessments since students still seek their educators' assistance to enhance their work's substance (Zhang, 2020). Furthermore, when utilising the AWE software, traditional techniques of producing evaluations must be noticed (Grimes & Warschauer, 2010; Qiang, 2014 & Ware, 2018).

Formative feedback and assessment may be the essential things that AWE software has contributed. The most recent version of the AWE programme incorporates features that facilitate lengthy instructional practice, such as a checker or detector for instances of plagiarism. ESL students' writing skills could improve due to reading this (Zawacki-Richter et al., 2019). While writing and coming to a conclusion in an English phrase or essay, ESL students commonly need help with spelling, punctuation, and grammar. The linguistic and pedagogical restrictions (Hanauer et al., 2019) cause these limits (Fitria, 2020a). Most of the time, this occurs unintentionally and without their awareness (Fitria, 2018). As a consequence of this, the teaching of English and the learning of English, particularly in writing, have to integrate grammar and spelling checks (Mammadova, 2019).

In an English as a Second Language (ESL) writing lesson, one of the incredible tools that may be used is called Grammarly. Grammarly was developed to make it easy for users to check their writing for grammatical errors, plagiarism, misspellings, and punctuation errors (2020). As a consequence of this, students may study Grammarly on their own time. This type of software is used for proofreading and may identify grammatical problems in

written material. According to O'Neill and Russel (2019), it may detect plagiarism and fix grammar, punctuation, and synonym usage errors. Previous studies have focused on investigating Grammarly in some detail. The primary research was conducted under the heading "The Usage of Grammarly in Evaluating English as a Foreign Language (EFL) Stating," and it was published in 2017. (Ghufron & Rosyida, 2018).

In order to lessen the number of mistakes that students make when writing in English as a second language (ESL), this research aims to evaluate the efficacy of language programming and feasible terms for educators to use in corrective instruction. This research endeavoured to answer whether there was a discernible distinction in the writing standards of university students who used and did not use the Sentence Structure Checker. This research also incorporates the usage of Grammarly. However, the primary focus of this investigation is on the presentation of Grammarly, which can improve the quality of the student's written English. It has been found by Soegiyarto and colleagues (2022) that using Grammarly not only helps students with their papers but also boosts their confidence. The application provides automated grammatical feedback to students by suggesting other words to use in their writing, which may help students improve their writing abilities.

Various strategies are used to assist children in developing their writing abilities. Recent studies (Nuro'azah, 2019; Nova, M. 2018; Parra G & Calero S., 2019) indicate that Grammarly was used to manage the process of students writing the text for their class assignments. These studies examined a wide range of resources, including narrative texts, abstracts, and free writing, to assist students in developing their writing abilities. A previous study has been done on integrating Grammarly into the process of composing text by utilising various genres. Zinkevich and Ledeneva drew attention to the usefulness of Grammarly as an instrument for identifying errors made by students, encouraging the expansion of students' vocabularies, and making necessary corrections to punctuation (2021).

It takes an excessive amount of time and effort, not to mention that it is very subjective, to monitor the writing process and provide students with pertinent and helpful criticism (Lim & Phua, 2019). People are increasingly turning to write improvement software like Grammarly and other computer-based programmes to help them improve their writing. Writing is an ability that is difficult to master through traditional education; however, new writing tools that are driven by artificial intelligence and are available on mobile devices have the potential to help students learn and grow their writing abilities. Writing may be challenging, emotional, and complex with a noteworthy research career (Rahimi & Zhang, 2018). In addition, linguistic and educational limitations make the situation much more difficult for students learning English as a second language (ESL) (Hanauer et al., 2019). Higher education, unfortunately, only offers enough preparation for those planning to pursue graduate degrees. One example of such a tool is Grammarly. Grammarly can identify and repair various writing problems related to sentence structure, spelling, and accentuation. According to the prior study's findings, there has been very little research done on the impact of AWE software on enhancing writing abilities, and the perceptions of Grammarly among students have yet to be explored. Conducting interviews to acquire a

more profound knowledge of automated writing evaluation, particularly Grammarly, would be intriguing. This study aims to analyse AWE's usefulness among university students in growing writing talents.

Students' writing abilities are progressing to the point where they must reach a higher level to compete in the global economy. The digital age has made writing a more critical talent. The traditional method of teaching a language is currently being challenged by introducing new teaching methods in which the learning process is no longer confined to a single physical location. Materials that have been the subject of innovation, such as Automatic Writing Evaluation (AWE), have the potential to be utilised in educational settings. Although the primary objective of the AWE is to help with the writing process in general, it is still essential that writing skills be employed to help with the learning process.

3.0 Methodology

The purpose of this study was to provide a helpful overview, and statistical analysis was incorporated into it. Similarly, a pre-post experiment was carried out with one set of samples. Within ten weeks of being subjected to AWE, this group was required to participate in an intervention.

3.1 Participants

It took much work to gather a representative sample of the population while the online classroom was being run because of the circumstances at the time. The student's mindset of responding to an additional task has been altered due to virtual learning. On the other hand, it was fortunate that many students were eager to participate in the research. A control group is being used in this investigation. This group responded to the questionnaire not once but twice, once before and once after a given time.

3.2 Instruments

A questionnaire set was created as a data-gathering instrument for this investigation. Typically, the questionnaire set included demographic profiles of respondents as well as research data. As previously stated, the study's participants were an experimental group. As a result, this study generated a questionnaire modified from Parra G. & Celero S. (2019) and Rani (2016).

3.3 Data Collection

After selecting the participants who were willing to cooperate, we gave each of them a series of questions to fill out. They were given ten weeks of exposure and were required to use AWE for one session to write a brief essay about their lives. When the participants had turned in their assignments, another set of questionnaires was given out to investigate their thoughts regarding using AWE in their writing.

Since it was the platform that offered the most significant degree of convenience for the researcher as well as the participants in the study, the dissemination of the questionnaire

was accomplished through the use of a Google form. Participants were instructed to react honestly and were not allowed to interact with one another.

3.4 Data Analysis

The information that was gathered for the study was analysed so that it could be used to offer answers to the questions presented by the research. In order to manually adjust the data statically and produce percentages, mean scores, and t-test analysis, the computation was performed using an Excel sheet and SPSS version 27. This calculation was carried out by hand. After that, each associated finding was reported while keeping the study's goals in mind.

4.0 Results

This section will elaborate on the study's objectives based on data analysis. The demographic profile of the participants should be demonstrated to give clear evidence of the source of the data collected in this study. As mentioned in the methodology, this study has obtained 72 participants from four universities: UiTM, UMP, UMK, and UM.

4.1 Research Objective 1: Student Perception of Writing Self-Proficiency

As a result, one of the study's aims is to determine student perceptions of writing self-proficiency. Pre and post-questionnaires were administered to assess their level of perception before and after being exposed to the use of AWE during the semester. The questionnaire has ten items that indicate the participants' perceptions.

Table 1: Paired Samples Statistics for Student Perception of Writing Self- Proficiency

NO.	Item		Mean	N	Std. Deviation	Std. Error Mean
1	I can use appropriate vocabulary and word forms to communicate effectively with the reader.	PRE-TEST	3.8056	72	.72460	.08539
		POST-TEST	4.1111	72	.70322	.08288
2	I can use appropriate spelling, capitalisation, and punctuation.	PRE-TEST	3.8056	72	.72460	.08539
		POST-TEST	4.1111	72	.70322	.08288
3	I can write an accurate summary of information I have read in English.	PRE-TEST	3.5556	72	.66901	.07884
		POST-TEST	4.0000	72	.65003	.07661
4	I can write an accurate summary of information I have read in English.	PRE-TEST	3.4444	72	.66901	.07884
		POST-TEST	3.7639	72	.74101	.08733
5	I can write a good conclusion for an English essay.	PRE-TEST	3.5833	72	.72675	.08565
		POST-TEST	3.8750	72	.69073	.08140
6		PRE-TEST	3.5972	72	.74417	.08770

	I can effectively brainstorm to gather ideas before writing.	POST-TEST	3.9444	72	.70987	.08366
7	I can write quickly in English.	PRE-TEST	3.3611	72	.81024	.09549
		POST-TEST	3.7222	72	.87568	.10320
8	I write for pleasure in my free time in English.	PRE-TEST	2.9861	72	.88003	.10371
		POST-TEST	3.5833	72	.96049	.11319
9	I reward myself when I have finished writing.	PRE-TEST	3.3889	72	1.09487	.12903
		POST-TEST	3.7917	72	.99205	.11691
10	I make notes or remember feedback on my writing so I can use it the next time I write.	PRE-TEST	3.6389	72	.99726	.11753
		POST-TEST	3.8750	72	.83813	.09877

Although all participants had a favourable opinion of their work in general, after exposure to AWE, certain elements appear fascinating to be examined. Table 1 above shows that participants' perceptions of their writing abilities have improved. For example, from 3.85 to 4.09, participants feel the usage of AWE has affected their acceptable spelling, capitalisation, and punctuation. On the other hand, writing for fun in my spare time increased from 2.93 to 3.33 after learning about AWE. In conclusion, participants have demonstrated a benefit from AWE, either in their writing skills or mindset towards writing in English.

To compare the usage of acceptable spelling, capitalisation, and punctuation before and after the intervention, a paired-sample t-test was used. When comparing before and after AWE exposure, the results show a substantial difference, with $M=3.8$ and $SD=0.72$ before AWE exposure and $M=4.1$ and $SD=0.70$ after AWE exposure, while the intervention, $t(71) = -3.57$ and $p = .001$. These findings imply that after being exposed to AWE, participants' perceptions of their writing improve. These findings indicate that the intervention affected participants. The findings imply that when individuals are exposed to AWE, their assessment of their writing improves.

These findings indicate that intervention affected participants' perceptions of their writing skills. The findings imply that when participants are exposed to the usage of AWE, their opinion of their writing improves. Nine of the ten measures examined revealed a significant difference in participants' perceptions of writing skills before and after the intervention. Only the last item, "practising taking notes or trying to recall feedback," shows a significant difference before and after the intervention.

4.2 Research Objective 2: Student's expectation of the use of AWE in their writing learning process

The study's second goal is to determine the respondents' expectations for using AWE in their writing. Before proceeding to their response to the research aim, their past exposure

to the usage of AWE was presented, including experience with AWE, knowledge of AWE, and varieties of AWE they were familiar.

Table 2: Respondents' Profile with AWE

No	Item	Respond	Percentage
1	Have you ever used AWE?	Yes	25(34.72%)
		Maybe	16(22.22%)
		No	31(43.06%)
2	Do you know what AWE is?	Yes	19 (26.34%)
		Maybe	17 (23.61%)
		No	36 (50%)
3	Types of AWE you know	Grammarly	70(97.22%)
		Criterion® Online Writing Evaluation Service	0(0%)
		MY Access!	2(2.78%)
		RightWriter	2(2.78%)
		WritePlacer	2(2.78%)
		Ginger Software	4(5.56%)
		GrammarK	6(8.33%)
		Grammarcheckme	9(12.5%)
		LanguageTool	20(27.78%)
		PaperRater	0(0%)
		Queequeg	0(0%)
		Spellchecker.net	16(22.22%)
		SpellCheckPlus	6(8.33%)
		WhiteSmoke	0(0%)

The frequency of responses for their experience is shown in Table 2 above, indicating that most of them are most likely not exposed to AWE. Only 34.72%, or 25%, of the 72 respondents said they used the AWE. 36 out of 72 respondents stated they needed to learn what AWE is. In addition, the table indicates the most common kind of AWE known by respondents. Following the order from top to bottom, Grammarly was the most popular, followed by Language Tool and SpellChecker.net, with 27% and 22.22%, respectively. The remainder of the AWE lists were usually unknown by the respondents, as shown by 0-12%.

Table 3: Paired Samples Statistics for Student Perception of AWE Assistance

No.	Item		Mean	N	Std. Deviation	Std. Error Mean
1	AWE gives detailed feedback.	PRE-TEST	3.7917	72	.62658	.07384
		POST-TEST	4.2500	72	.70711	.08333
2	AWE makes helpful suggestions for improving my work.	PRE-TEST	4.0000	72	.60514	.07132
		POST-TEST	4.3889	72	.64032	.07546
3	AWE gives good explanations about my errors.	PRE-TEST	3.9167	72	.74588	.08790

		POST-TEST	4.2222	72	.73585	.08672
4	AWE helps me understand grammar rules.	PRE-TEST	3.8889	72	.68290	.08048
		POST-TEST	4.3333	72	.73158	.08622
5	I agree that students get useful with using AWE in writing class.	PRE-TEST	4.0556	72	.60255	.07101
		POST-TEST	4.3750	72	.65944	.07772
6	AWE is easy to use, especially in writing class.	PRE-TEST	4.0694	72	.65706	.07744
		POST-TEST	4.4028	72	.66417	.07827
7	AWE is a better choice for evaluating your writing than a human evaluator.	PRE-TEST	3.5000	72	.80491	.09486
		POST-TEST	4.0278	72	.87165	.10273
8	I prefer AWE over human evaluator.	PRE-TEST	3.3611	72	.99726	.11753
		POST-TEST	3.7361	72	1.03452	.12192

According to table 3, questionnaire items prompted respondents to provide feedback on what AWE gives them and their view of AWE's value and usage in writing. Based on the findings, four questions were asked about what AWE gives them to help them write, and four more regarding their perception of AWE's usefulness and usage in writing. Each item showed increasing scores following the intervention session, reaching 4.00 or above, even though all good scores of no less than 3.00 were indicated in the pre-test.

As illustrated in table 2, for item 1: AWE delivers extensive feedback received 3.79 before and 4.25 after the intervention, item 2: AWE makes valuable ideas for enhancing my work received 4.00 and 4.39, item 3 AWE gives good explanations about my mistakes received 3.29 and 4.22. Item 4 AWE assists me in understanding grammatical rules received 3.89 and 4.33. Item 5 indicated that students get usefulness with the use of AWE in a writing class with scores of 4.06 and 4.38, item 6 indicated that students get usefulness with the use of AWE in a writing class with scores of 4.07 and 4.40, item 7 AWE is a better choice for evaluating your writing compared to a human evaluator received 3.50 and 4.03, and the final item is item 7 indicated that students get usefulness with the use of AWE in a writing class with scores of 3.36 and 3.

Table 3: Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	AWE gives detailed feedback.	- .45833	.80382	.09473	-.64722	-.26944	- 4.838	71	.000
Pair 2	AWE makes helpful suggestions for improving my work.	- .38889	.79710	.09394	-.57620	-.20158	- 4.140	71	.000
Pair 3	AWE gives good explanations about my errors.	- .30556	.91373	.10768	-.52027	-.09084	- 2.838	71	.006
Pair 4	AWE helps me understand grammar rules.	- .44444	.74850	.08821	-.62033	-.26856	- 5.038	71	.000
Pair 5	I agree that students get useful with using AWE in writing class.	- .31944	.68846	.08114	-.48123	-.15766	- 3.937	71	.000
Pair 6	AWE is easy to use, especially in writing class.	- .33333	.76912	.09064	-.51407	-.15260	- 3.677	71	.000
Pair 7	AWE is a better choice for evaluating your writing than a human evaluator.	- .52778	.93405	.11008	-.74727	-.30829	- 4.795	71	.000
Pair 8	I prefer AWE over human evaluator.	- .37500	1.04055	.12263	-.61952	-.13048	- 3.058	71	.003

These questionnaire items were divided into two themes: what AWE offers to help with writing and how people perceive AWE's usefulness and usage in writing. The first theme includes Items 1 through 4, while the second theme includes Items 5 through 8. The following are examples of the outcomes:

Theme 1 - What AWE Can Do to Help With Writing

For Item 1, a paired-sample t-test was used to evaluate the perception of the completeness of AWE's feedback before and after the intervention. Before the intervention, $M=3.8$ and $SD=0.72$. After the intervention, $M=4.1$ and $SD=0.60$. These findings indicate that the intervention had an effect, as participants believed that the feedback received by AWE was more thorough after being exposed to it. At the 0.05 level of significance, $t(71) = -4.80$ and $p = .000$. As a result, it is significant.

The paired-sample t-test done on Item 2 contrasted the perception of the utility of the proposal offered by AWE before and after the intervention. The results showed a substantial difference, with $M=4.0$ and $SD=0.60$ before and $M=4.3$ and $SD=0.64$ after the intervention. The intervention had a $t(71) = -4.14$ and a p-value of .000. The findings indicate that when participants were exposed to the usage of AWE, they regarded the suggestions offered by AWE to be more helpful.

The third paired-sample t-test was performed on Item 3, which asks if AWE provides adequate explanations for mistakes. The intervention was $t(71) = -2.81$ and $p = .006$, indicating that the intervention affected participants; particularly when participants were

exposed to the application of AWE, they assessed that AWE provides good reasons for errors made. Before the intervention, $M=3.9$ and $SD=0.75$ were found to be significant; however, after the intervention, $M=4.2$ and $SD=0.74$ were found to be significant.

The last paired-sample t-test for theme 1 was on participants' perceptions of AWE, assisting them in understanding grammatical rules (Item 4). There was a significant difference before ($M=3.9$, $SD=0.68$) and after the intervention ($M=4.3$, $SD=0.73$); $t(71) = -5.04$, $p = .000$. These findings indicate that the intervention affects the participants. The findings imply that when participants are exposed to the usage of AWE, they believe it helps them comprehend grammatical rules better.

Topic 2 - Perceptions of AWE's Usefulness and Application in Writing

The first paired-sample t-test for topic 2 was on Item 5, which was on the advantages of applying AWE in writing class. There is a significant difference between before and after intervention ($M=4.0$, $SD=0.6$) where the intervention was $t(71) = -3.90$ and $p = .000$. These findings indicate that the intervention affected participants. The findings indicate that students benefited from adopting AWE in writing class.

The paired-sample t-test on Item 6 was on the ease of use of AWE, particularly in writing class. $M=4.1$ and $SD=0.66$ before the intervention, and $M=4.4$ and $SD=0.66$ after the intervention. The intervention had a $t(71) = -3.70$ and a $p = .000$, indicating that it does contribute to participants believing that AWE is simple to use, particularly in writing class.

The second paired-sample t-test for this topic was on Question 7, "Is AWE a superior alternative for assessing participants' writing compared to human evaluator?". This test's results likewise show a significant difference between before and after intervention ($M=3.5$, $SD=0.80$). The intervention had a $t(71)$ of -4.80 and a p -value of $.000$. These findings imply that after being exposed to AWE, participants believe it is a better alternative for evaluating their work than a human evaluator.

The paired-sample t-test on Item 8 was designed to evaluate participants' preference for AWE over the human evaluator before and after the intervention. The difference between before and after the intervention was substantial, with $M=3.4$, $SD=1.00$ before intervention and $M=3.7$, $SD=1.00$ after the intervention, $t(71) = -3.06$, $p = .003$. The findings indicate that after being exposed to AWE, participants prefer AWE over a human examiner.

5.0 Discussion

Around the period of the outbreak, many individuals who worked on the internet and wrote in English as part of their day-to-day business recognised the arrival of AWE, particularly in the form of software called Grammarly. In addition to translation software, online voice dubbing, and various other services, the Automated Writing Enhancement (AWE) platform, which is accessible online and promotes itself extensively via social media, has gradually shifted its emphasis from improving writing to introducing computer assistance in linguistic usage.

As a result, the outcomes of the study provide an analysis of English language students' knowledge, comprehension, and expectations of the AWE's value in increasing their writing learning process. When asked how they felt before and after the intervention period for self-proficiency in writing, most participants offered positive responses. It was established that within ten weeks, the participants had improved their writing abilities by utilising Grammarly to prepare for the writing task they had been given. The primary objective of the study was successfully achieved as a result.

This main suggestion was proved by further questions on the participants' awareness, level of knowledge, and kind of Grammarly before and after the intervention time. In addition, the study's second objective was to validate the potential advantages and help that Grammarly may offer. According to the results section, respondents claimed they needed to familiarise themselves with Grammarly or had no prior experience using the platform.

6.0 Conclusion

The goal of this study is to investigate the efficacy of AWE among university students, as well as the students' perceptions of Grammarly's effectiveness. To summarise the findings and discussions, the study found that Grammarly effectively used vocabulary, language, spelling, and punctuation. However, it is less effective in enhancing students' ESL writing content and organisation. Grammarly's application was also evaluated favourably in this study.

The outcomes of this study suggest that employing technology in this digital learning environment cannot adequately assist the process of ESL writing evaluation. Instructors explaining and assisting their students in organising their writing and generating good material in ESL writing are still required. Students had difficulties using this software due to a bad internet connection (Ananda et al., 2021). According to Fitriani and Nurazni (2022), Grammarly can change the meaning of writing. This application, Grammarly, and traditional ways must be used to provide more thorough ESL writing evaluation findings.

According to M. Ali Ghufon (2019), Grammarly helps reduce mistakes in vocabulary usage, language use (grammar), and writing styles (spelling and punctuation). Instructors now have more time to assist students in refining the content and structure of their work. As a result, educators' efforts must be noticed. Because students' English abilities differ, instructors should evaluate the proper strategy while utilising Grammarly in writing classes for ESL students.

Higher education must be able to manage learning processes to thrive, expand continuously, and adapt to external challenges and demands (Rahim et al., 2022). In addition, given the limited number of studies conducted on the integration of AWE software, it is necessary to research the different types of AWE software. In order to contribute to the field of study, it was also proposed that comparative research be conducted in a different context for the deployment of AWE software. As a result, these findings might be valuable

to students, educators, or writing instructors who want to include Grammarly in their ESL writing classes.

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Article Contribution to Related Field of Study

By studying the effectiveness of AWE software that helps users improve their writing, users and instructors can be more at ease to rely on and improve as they learn from them. The whole study would help both instructors and learners to understand the tools that they have before them and to let them gain as much from them and not just use them as it is.

References

- Ab Rahim, S. N. S., Jamaludin, N. L. ., Ali, A. ., & Isa, S. S. . (2022). Influence of Innovation in Education: Mediation of knowledge transfer. *Environment-Behaviour Proceedings Journal*, 7(S19), 311-316. <https://doi.org/10.21834/ebpj.v7iSi9.4280>
- Ab Wahid, M., Lee, W. K., & Baharudin, F. (2020). Implementing project-based learning for sustainability management course at postgraduate level. *Asian Journal of University Education*, 16(2), 84-92.
- Agustin, R., & Wulandari, S. (2022). The analysis of grammatical errors on students' essay writing by using Grammarly. *Jurnal Pendidikan Bahasa Inggris Proficiency*, 4(1), 39-46. <https://doi.org/10.32503/proficiency.v4i1.2247>
- Ananda, M., Nisa, R., & Safura, S. (2021). Students' Perceptions Towards the Use of Grammarly in Checking Grammar in Assignment. *Journal of English Language and Education*, 1(2), 72-77. [http://dx.doi.org/10.1016/S1607-551X\(08\)70133-5](http://dx.doi.org/10.1016/S1607-551X(08)70133-5)
- Baharuddin, M. F. ., Mohd Amin, Z. ., Rahmad, F. ., & Kaspol, M. . (2022). Satisfaction on Online Learning during Covid-19 Pandemic: Perspective of Malaysian students. *Environment-Behaviour Proceedings Journal*, 7(S10), 147-152. <https://doi.org/10.21834/ebpj.v7iSi10.4108>
- Bouchoux, D. E. (2019). *Legal Research and Writing for Paralegals*. Wolters Kluwer Law & Business.
- Faller, J. M. V. (2018). Grammarly Investigation into EFL Writing Issues Involving Omani Learners. *International Journal of Language & Linguistics*, 5(3). <https://doi.org/10.30845/ijll.v5n316>
- Fitria, T. N. (2018). Error Analysis Found in Students' Writing Composition of Simple Future Tense. *ELS Journal on Interdisciplinary Studies in Humanities*, 1(3), 240-251.

- Fitria, T. N. (2020a). Error Analysis Found in Students' Writing Composition in Simple Past Tense of Recount Text. ENGLISH FRANCA: *Academic Journal of English Language and Education*, 4(2), 141. <https://doi.org/10.29240/ef.v4i2.1154>
- Fitria, T. N. (2020b). Spelling Error Analysis In Students' Writing English Composition. *Getsempena English Education Journal*, 7(2), 240–254. <https://doi.org/10.46244/geej.v7i2.988>
- Fitriani, K., & Nurazni, L. (2022). Exploring English Department Students' Perceptions on Using Grammarly to Check the Grammar in their Writing. *Journal of English Teaching*, 8(1), 15–25.
- Ghufron, M. A. (2019). Exploring an Automated Feedback Program Grammarly and Teacher Corrective Feedback in EFL Writing Assessment: Modern vs. Traditional Assessment. *ELLIC*. *ELLIC* 2019, 307.
- Ghufron, M. A., & Rosyida, F. (2018). The Role of Grammarly in Assessing English as a Foreign Language (EFL) Writing. *Lingua Cultura*, 12(4), 395–4 <https://doi.org/10.21512/lc.v12i4.4582>
- Grammarly. (2020). *About Grammarly*. Retrieved from <https://support.grammarly.com/hc/en-us/categories/115000018611-About-Grammrlly>
- Grimes, D., & Warschauer, M. (2010). Utility in a fallible tool: A multi-site case study of automated writing evaluation. *The Journal of Technology, Learning, and Assessment*, 8(6), 1–44.
- Hanauer, D.I., Sheridan, C.L., Englander, K. (2019). *Linguistic injustice in the writing of research articles in English as a second language: data from Taiwanese and Mexican Researchers*.
- Ibrahim, Z. ., Hussin, N. ., Wan Mokhtar, W. N. H. ., & Hashim, H. . (2022). Assessing the Effect of Digital Social Media towards Face to Face Communication during Pandemic COVID-19 in Higher Educational Institutions. *Environment-Behaviour Proceedings Journal*, 7(S110), 41–46. <https://doi.org/10.21834/ebpj.v7iS110.4099>
- Koltovskaia, S. (2020). Student engagement with automated written corrective feedback (AWCF) provided by Grammarly: a multiple case study. *Assessing Writing* 44 (June 2022).
- Lim, F.V., Phua, J. (2019). Teaching writing with language feedback technology. *Comput. Compos.* 54, 102518.
- Maharani, M. M. (2018). Graphic Organisers to Improve Students' Writing on Recount Paragraphs. *Metathesis: Journal of English Language, Literature, and Teaching*, 2(2), 211–221. <https://doi.org/10.31002/metathesis.v2i2.942>
- Mammadova, T. (2019). *Teaching Grammar to a Grammar-Free Generation*. Cambridge Scholars Publishing.
- Nova, M. (2018). Utilising Grammarly in evaluation academic writing: A narrative research EFL students' experience. *Journal of English education and applied linguistic*. <https://kip.ummetro.ac.id/journal/index.php/English>
- Mat Zali, M. ., Mohd Razlan, R. ., Raja Baniamin, R. M. ., & Setia, R. . (2022). Interactional Metadiscourse Analysis of ESL Learners' Essays. *Environment-Behaviour Proceedings Journal*, 7(S19), 55–60. <https://doi.org/10.21834/ebpj.v7iS19.4248>
- Mohammad, S. N., Yusof, M. K. T. M., Puaad, M. B. F. M., Jamal, M. H., & Wee, L. S. (2023). Investigating Students' Perception and Preferences of Online Learning in UiTM Pasir Gudang Campus. *Asian Journal of University Education*, 19(1), 223–234.

- Naim, I. A. M., Luqman, N. M. A. N., & Matmin, J. (2020). Enhancing Students' Writing Performance in Higher Learning through Think-Write-Pair-Share: An Experimental Study. *Asian Journal of University Education*, 16(3), 255-264.
- Nuro'azah, D. (2019). The effectiveness of Grammarly checker toward students' writing quality. English. *Fakultas Tarbiyah dan Ilmu Keguruan*. URI: <http://repo.iain-tulungagung.ac.id/id/id/eprint/12020>
- O'Neill, R., & Russell, A. M. T. (2019). Stop! Grammar time university students' perceptions of the automated feedback program Grammarly. *Australasian Journal of Educational Technology*, 35(1), 42-56.
- Parra, G. L., & Calero, S. X. (2019). Automated writing evaluation tools in improvement of the writing skill. *International Journal of Instruction*, 12(2), 209-226. <https://doi.org/10.29333/iji.2019.12214a>
- Perdana, I., & Farida, M. (2019). Online Grammar Checkers and Their Use for EFL Writing. *Journal of English Teaching, Applied Linguistics, and Literatures (JETALL)*, 2(2), 67-76. <https://doi.org/10.20527/jetall.v2i2.7332>
- Popenici, S.A.D., Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. *Res. Pract. Technol. Enhanc. Learn. (RPTEL)* 12 (1).
- Qiang, Z. (2014). An experimental research on applying automated essay scoring system to college English writing course. *International Journal of English Language Teaching*, 1(2), 35-41. <https://doi.org/10.5430/ijelt.v1n2p35>
- Rahimi, M., Zhang, L.J. (2018). Writing task complexity, students' motivational beliefs, anxiety and their writing production in English as a second language. *Read. Writ.* 32 (3), 761-786.
- Rahman, N. A. A., Zulkornain, L. H., & Hamzah, N. H. (2022). Exploring Artificial Intelligence using Automated Writing Evaluation for Writing Skills. *Environment-Behaviour Proceedings Journal*, 7(S19), 547-553.
- Rahman, N. A. A., & Othman, Z. (2020). Enhancing Tvet Learners'21st Century Skills Through Innovative Speaking Skill Technique.
- Rahman, N. A. A., & Maaarof, N. (2015). The Relationship between Language Learning Strategies and Students' Motivation in Learning English as A Second Language. *Jurnal Teknikal Sosial Sains*, 1-17
- Rani, Theodora. (2016). Students Perception of Self-Assessment and the Use of Self-Assessment in English Writing Skill. In KOLITA 14 : *Konferensi Linguistik Tahunan Atma Jaya Keempat Belas*, page 217-221.
- Soegiyarto, M. S., Putri, R. A., & Saputra, S. D. (2022). *The Importance of Getting Automated Grammar Feedback via Grammarly*, for Increasing Students ' English Language Proficiency.
- Sarkam, N. A., Nasrudin, N. H., Razi, N. F. M., & Junid, R. A. (2022). Student readiness factors for online distance learning (ODL) among Malaysian Public Universities during COVID-19: A Proposed Conceptual Model. *Asian Journal of University Education*, 18(4), 1048-1061.
- Ware, P. (2018). Automated writing assessment. In J. I. Liontas, & M. Delli Carpini (Eds.), *The TESOL Encyclopedia of English Language Teaching*(pp. 1-7). Hoboken, NJ: Wiley Blackwell. <https://doi.org/10.1002/9781118784235.eelt0543>
- Yang, C. (2013). How Chinese beginning writers learn English writing: A survey of writing strategies. *Journal of Educational and Social Research*, 3(1), 9-18. doi: 10.5901/jesr.2013.v3n1p9

Zawacki-Richter, O., Marín, V.I., Bond, M., Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education – where are the educators? *Int. J. Educat. Technol. Higher Educat.* 16 (1).

Zhang, Z. (2020). Engaging with automated writing evaluation (AWE) feedback on L2 writing: Student perceptions and revisions. Elsevier Inc: *Assessing writing*, pp. 43, 1-14

Zinkevich, N. A., & Ledeneva, T. V. (2021). Using Grammarly to Enhance Students' Academic Writing Skills. *Professional Discourse & Communication*, 3(4), 51–63. <https://doi.org/10.24833/2687-0126-2021-3-4-51-63>