

# Exploring Artificial Intelligence using Automated Writing Evaluation for Writing Skills

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## Abstract

This study aims to investigate the effectiveness of AI software which is Automated Writing Evaluation (AWE) in detecting grammatical errors in improving writing skills among Malaysian public university students and examine their perceptions of AI software in improving writing skills. The findings of this study show the positive perceptions of students towards the implementation of AWE. The study provided implications for the effective use of AI software (AWE) in ESL writing classrooms. Finally, future researchers are expected to conduct research on a similar topic to enhance the impact and significance of this study.

Keywords: Technology application, Artificial Intelligence, writing skills, automated writing evaluation

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DOI: <https://doi.org/10.21834/ebpj.v7iS19.4304>

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## 1.0 Introduction

AI is an umbrella word for an automated technology that can mimic human cognitive processes such as learning, reasoning, and self-correction (Popenici and Kerr, 2017). One of the most significant aims of AI is to create automated gadgets that can understand the environment and perform tasks in the same way that people do. New writing programmes that may offer versatile and time-saving improvements to the writing curriculum are being merged to deliver the Grammarly features in a single integrated application (Koltovskaia, 2020). With technological advancements, artificial intelligence (AI) has created new teaching and learning experiences for instructors and students in the areas of assessment, tutoring, content development, and feedback.

Perhaps the most significant contributions of digital writing tools are defined by formative feedback and evaluation. Furthermore, the new AI Applications have a thorough instructional practise component as well as a plagiarism detection component that may aid ESL students in their research writing development (Zawacki-Richter et al., 2019). English Second Language (ESL) learners/students may make mistakes in numerous parts of writing, such as spelling, punctuation, and grammar, when writing and finishing an English phrase or essay (Fitria, 2020a). When they commit an error, the students are unaware of it, and it occurs accidentally (Fitria, 2018). Spelling is the skill of correctly combining letters to make a word, hence it is related to the right selection and arrangement of letters that create a word (Fitria, 2020b). Punctuation is a type of punctuation mark used in writing, and each punctuation or symbol has a specific purpose. Grammar, along with spelling and punctuation, is one of the linguistic components of English Second Language (ESL) writing (Perdana & Farida, 2019). According to Mammadova (2019, p. 54), grammar and spelling checker online software is crucial in English language teaching and learning.

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It is utilised when other language teaching materials are necessary, i.e. when teachers are unable to discover what they needed in other printed or online resources. According to Bouchoux (2019, p. 545), there are several simple and free tools that users may utilise to improve their English writing. Grammarly is one among them. Grammarly is available for use and testing at <https://www.grammarly.com/>. Grammarly detects and corrects grammatical, spelling, punctuation, and other mistakes in their work. Grammarly's free browser extension or Grammarly for Microsoft Office may be downloaded by users. Grammarly's premium edition is accessible for free. Writing is a challenging talent (Maharani, 2018). It is backed by remarks such as "writing is such a challenging endeavour that requires a great lot of cognitive and linguistic abilities" (Faller, 2018; Maharani, 2018). When writing and finishing an English expression or exposition, ESL university students may commit errors in a few parts of writing, like spelling, accentuation, and sentence structure (Fitria, 2020a). At the point when they make a mistake, the students are oblivious of it, which occurs by some coincidence (Fitria, 2018). Spelling is the capacity to effectively join letters to frame a word. In addition, along these lines, it is related to the exact choice and game plan of letters that structure a word (Fitria, 2020b). Syntax is a semantic part of ESL writing, spelling, and accentuation (Perdana & Farida, 2019). The research questions are as follows:

1. How effective of AWE in improving ESL writing among university students?
2. What are the students' perceptions of the implementation of AWE?

This study aims to explore the effectiveness of AWE among university students. In addition, the study also investigated the student's

## 2.0 Literature Review

AWE software is a useful tool for both educators and students when it comes to writing correction because it was able to evaluate students' ESL writing in teaching and learning. Furthermore, while using the AWE software, the traditional ways of writing evaluations cannot be overlooked (Grimes & Warschauer, 2010; Qiang, 2014; Ware, 2018). AWE software cannot simply replace educator's evaluations since students still require assistance from their educators to improve the content of their work (Zhang, 2020).

The most significant contributions of AWE software could perhaps be the formative feedback and evaluation. Recent AWE software comes with components supporting thorough instructional practice such as a plagiarism checker or detector. This may aid ESL students in their writing (Zawacki-Richter et al., 2019). Normally, due to linguistic and educational limitations (Hanauer et al., 2019), ESL learners do make mistakes in spelling, punctuation, and grammar, when writing and finishing an English phrase or essay (Fitria, 2020a). This usually happens accidentally without them realizing it (Fitria, 2018). Due to this, grammar and spelling checkers must be integrated into English teaching and learning, especially in writing (Mammadova, 2019).

Grammarly is one of the AWE that can be used in an ESL writing lesson. It is a proofreading software that can be used to detect grammatical mistakes in papers. It corrects spelling, punctuation, synonyms, and detects plagiarism (O'Neill & Russel, 2019). Grammarly has been the subject of various earlier studies. The main study is named "The Part of Grammarly in Surveying English as an Unknown dialect (EFL) Stating" (Ghufron & Rosyida, 2018). The purpose of this research is to look at the viability of language programming and viable words for educators' remedial advice to decrease students' mistakes in ESL writing. The reason for this study was to check whether there was a huge contrast in the writing norms of university students who utilized and did not utilize the Sentence Structure Checker. This investigation also covers the use of Grammarly, but this investigation focuses on Grammarly's presentation, which can improve the students' writing papers, similar to the quality of the students' English writing.

Previous research has been performed on incorporating AWE software into writing text by administering various genres. Various approaches are used to improve students' writing skills. Recent studies (Nuro'azah, 2019; Nova, M. 2018; Parra G & Calero S, 2019) stated that AWE software was used to administer writing text for the students' tasks in class. These studies looked at several texts to improve students' writing of a text, such as narrative text, abstracts, and free writing.

Monitoring the writing process and providing relevant helpful feedback to students takes too much time, effort, and is subjective (Lim and Phua, 2019). Grammarly software and other computer-based programmes are increasingly being used to help people write better. New writing tools driven by Artificial Intelligence (AI) and available on mobile devices are potential tools to help students acquire and develop writing abilities that are difficult to master through traditional instruction. Writing may be a troublesome, emotive, and complex procedure with a notable scientific career (Rahimi and Zhang, 2018). Writing in English is a complicated, necessary, and integrative endeavour that both native and international students struggle with (Campbell, 2019). Furthermore, for English second language (ESL) students, the issue is compounded by linguistic and educational limitations (Hanauer et al., 2019). Unfortunately, little is done in higher education to prepare graduate students. Grammarly is one such instrument. Grammarly distinguishes and revises language structure, spelling, accentuation, and other composition blunders naturally. According to the findings of the previous study, little research has been done on the impacts of AWE software to improve writing skills and students' perceptions of Grammarly were not explored. This study seeks to investigate the efficacy of AWE among university students in improving writing skills and it would be exciting to conduct interviews to have a deeper grasp of automatic writing evaluation, particularly Grammarly.

## 3.0 Methodology

Both quantitative and qualitative research methods were employed in this study which involved data collection via a questionnaire and interviews with the students. Thus, this study employed a mixed-method design. The study employed a pre-test and post-test research design. The experimental group used AWE (Grammarly) and another group as the control group. The post-test results for both groups were compared in order to determine their writing performance. The quantitative data were collected from the survey questionnaire (n=100)

whereas the qualitative data were collected from the interview of ten participants. The main objective of this study was to investigate the effectiveness of AWE software among university students. The stratified sampling technique was used in this study to examine the students' perception of the implementation of Grammarly. The participants of the study were 100 undergraduate students (35 males 65 females) from public universities in Malaysia. Respondents enrolled in a variety of diploma and degree programs. The population had been studying the English writing course and ages ranged from 18 to 22 years old. The researchers evaluated the sets of recognized faults to discover some common ground to collect data on the efficiency of Grammarly's grammatical error detection. After combining the separate mistake lists into one, the common list was compared to the Grammarly feedback. The comparison's findings were confirmed.

#### 4.0 Findings

Grammarly is a free online grammar and spelling checker that corrects writing mistakes in the English language framework. Grammarly will suggest the proper term if there are any erroneous words in the English structure. The use of Grammarly software improved performance. Before using Grammarly, the performance of test score was 58 out of 100. This score reflects the text's writing quality. It can be improved by using Grammarly's suggestions. The performance text score after using Grammarly is 83 out of 100. This score reflects the text's writing quality. The following is the outcome of a text before and after using Grammarly software:



Figure 1. The view before pasting the document

Figure 1 shows the view before the users upload documents to see Grammarly feedback. The Grammarly document allows the user to write text directly on the document, download their document as a text file, upload content, and change the settings. After creating an account, the next step is to click, upload the file, or paste the text into the Grammarly software. This software can scan, check, and offer information on which document portions need to be updated automatically.

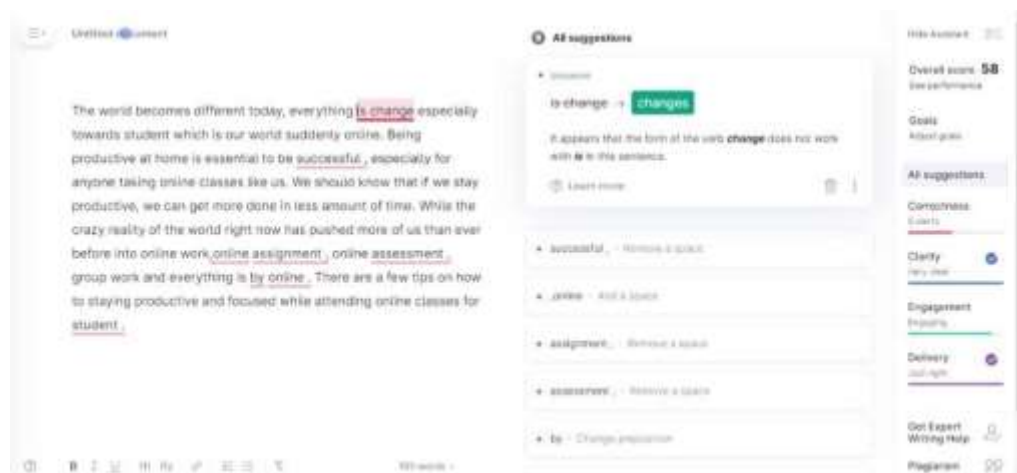


Figure 2. The View of Document Before Using Grammarly Punctuation (score is 58%)

In figure 2, it shows before using Grammarly and the performance of the test score is 58 out of 100. This score shows the quality of writing in this text. The performance can be increased by using Grammarly software. The word 'is change' appears that the form of the

verb does not work with “is” in this sentence. It needs to remove the word “is” to “everything changes, especially towards students which is our world suddenly online.

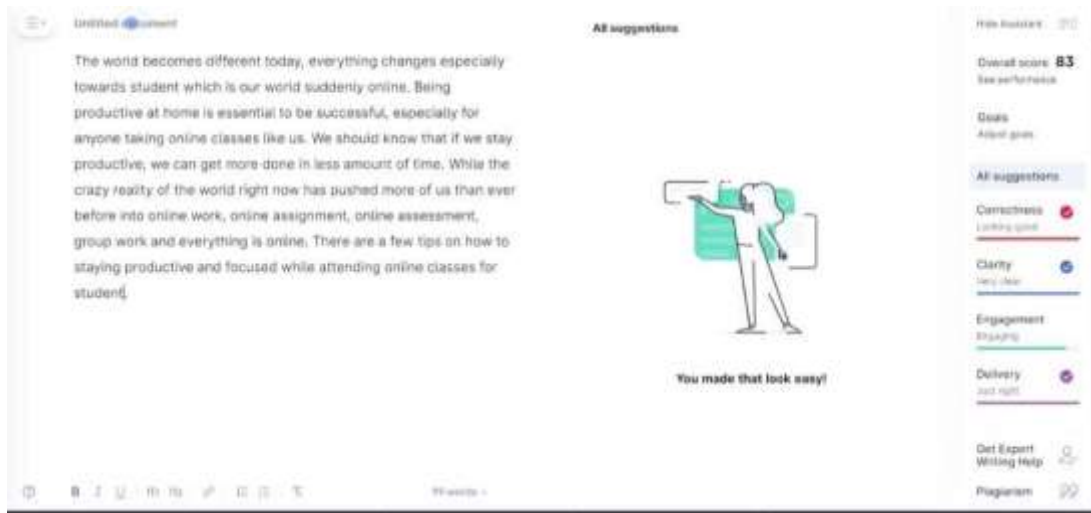


Figure 3. The view of sample document after using Grammarly punctuation (the score has improved to 83%)

Figure 3 displays that after using Grammarly and the performance of the test score is 83 out of 100. This score shows the quality improvement of writing in this text is increased from 58 percent to 83 percent. We can increase the score based on Grammarly's suggestions. Grammarly shows the precision of the term just as the clarification of why the picked word isn't right. Grammarly is a piece of programming that assists you with fixing writing as per English norms.

Based on the analysis, using Grammarly software shows the performance increased before using Grammarly, the student's grade was presented as 58 out of 100. Following the use of Grammarly, the presentation students' content score was 83 out of 100. This score shows the nature of the writing in this content has expanded. The scientists suggested that university students use Grammarly. The results were supported by the findings of the questionnaire distributed to 100 students. The results are presented in Figure 4 below.

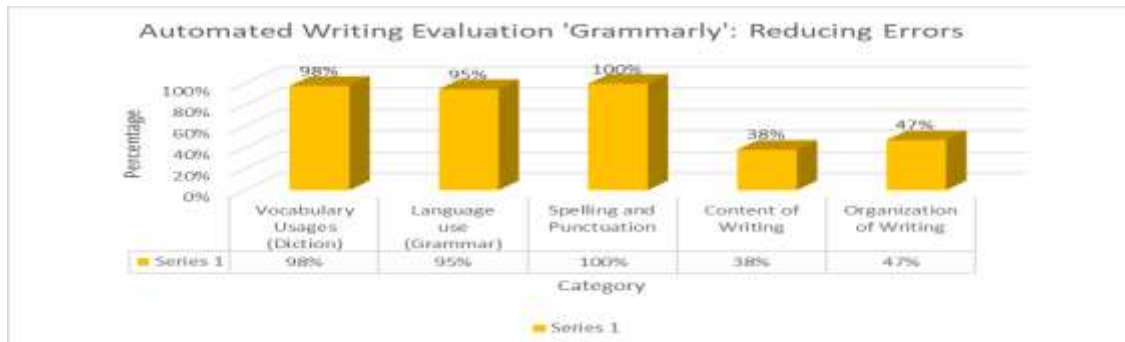


Figure 4. The results of the questionnaire distributed to students dealing with Grammarly.

According to the results of a closed-ended questionnaire sent to 100 students and followed by a 10 students' interview, the majority of the students, around 98 percent, believed that Grammarly could, directly and indirectly, improve students' ESL writing. According to the questionnaire, 97 percent of the students favoured the use of Grammarly in ESL classes. Furthermore, the interview revealed that the students have a positive perception regarding the use of Grammarly. Students might independently examine and assess their work by utilising Grammarly. They could examine their grammatical structures, punctuation, spelling, and, of course, the organization and content of their writing right away. This activity truly challenges and motivates them, especially in this digital learning environment as university students. Students are enthused and motivated to continue studying and writing in English. The following is the interview excerpt.

*“For me, I think using Grammarly really helps me a lot in the writing process. This software really helps and motivates me to write I know my mistakes and I am able to identify my grammatical errors. I also learn a lot to improve my writing skills.” (MK)*

*“In the first place, frankly speaking, writing is the toughest skill in English. Luckily, when I learn and use Grammarly software, it motivates me to always keep learning and writing. Personally, I really love this technique. I am able to check my spelling, subject-verb agreement, grammar, punctuation, and preposition by myself and I feel that emmm.....Yes, I am able to do it and I love it!” (QH)*The findings of the interview were consistent with the results of the questionnaire distribution. Grammarly is superior at minimising mistakes in word usage (diction), language use (grammar), spelling, and punctuation. However, it is less effective in improving the content and

organisation of students' ESL writing. One of the students said that this is because Grammarly can clearly and immediately detect ESL writing problems or flaws in terms of vocabulary usages, language use, spelling, and punctuation. The following is an extract from the interview.

*“So far, when I use Grammarly, I am able to improve my spelling, punctuation, and grammar because Grammarly can detect errors easily. Grammarly could not help me to improve the content of writing and organize the writing but I em.....I think it’s ok. It still motivates me in my writing process”.* (DH)

Table 1. Students' perceptions towards the implementation of AWE in ESL writing class.

Categories	Students' Perceptions	
	Number of Respondents	Percentage
Positive	88	88%
Neutral	12	12%
Negative	-	-
Total Respondents	100	100%

The data showed that 88 students or 88 percent had a positive perception of the implementation of AWE in ESL writing while 12 students or (12%) of students' perception was neutral.

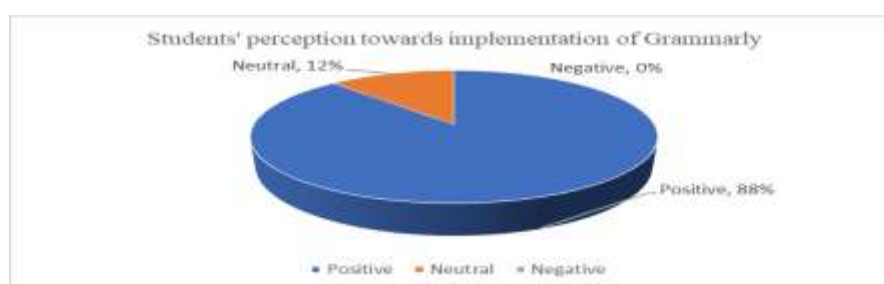


Figure 9. The students' perception of the implementation of AWE.

Grammarly aided students during the writing process. Since this software informed them of their errors in spelling, punctuation, preposition, space, and subject-verb agreement. The use of Grammarly inspired the students to write. According to the interpretation provided above, the student's perception of the use of Grammarly in learning to write was positive, and their writing improved. It assisted them in strengthening their ability to complete their ESL writing.

### 5.0 Discussion

This study aims to examine the effectiveness of AWE among university students and also investigated the students' perception of the implementation of Grammarly. To summarise the data and discussion, the study found that Grammarly was successful in terms of vocabulary usage, language use, spelling, and punctuation. It is, however, less effective in improving the content and organisation of students' ESL writing. This study also showed a positive perception of the implementation of Grammarly.

According to the findings of this study, utilising technology in this digital learning environment cannot adequately assist the process of ESL writing assessment. It still requires certain conventional methods of evaluation, such as instructors explaining and guiding their students on how to arrange their writing and create effective material in ESL writing. Students encountered various difficulties while using this software due to a bad internet connection (Ananda et al., 2021). Fitriani and Nurazni (2022) stated that Grammarly could change the meaning of writing. Integration of this software, Grammarly, and traditional methods is critical for obtaining more thorough ESL writing evaluation findings. Educators now have more time to assist students in revising their writing content and structure. As a result, educators' roles cannot be overlooked. When utilising Grammarly for ESL students in writing class, educators should evaluate the proper strategy since students have different levels of English proficiency. Furthermore, a study on the other AWE software is required, as the literature on the combination of AWE software is yet seldom investigated. In addition, it was proposed that comparable research be conducted in a different context for the deployment of AWE software to contribute to the field of study. As a result, these findings may be useful for students, educators, or writing instructors who want to include Grammarly in their ESL writing classes.

### 6.0 Conclusion and Recommendations

From this study, university students use Grammarly. Grammarly is a web application that can perform punctuation checks effectively, beginning with word spelling, sentence structure, and standard syntax. Grammarly is free, so it is enthusiastically prescribed for individuals who need to interpret different reports or articles that utilize unknown dialects. If tests or articles contain language and we don't understand

English, Grammarly can help by checking the spelling of sentences in English construction and correcting errors recorded on paper. Grammarly, in this sense, is not a standard like some other spells that have a slew of rules. Grammarly can be viewed as adjusting or ideas, which implies that Grammarly will illuminate us rapidly, yet, at the same time, decisively.

Thus, it could very well be asserted that if university students had not gotten all around the designated investigation, they would not have gotten a handle on the input and satisfied their writing objective of delivering a superior rendition of their article. It is reasonable to believe that the writing criticism given has a significant impact on both the university students' writing and their attitude toward writing. University students had the option to progress with their paper modifications since they got helpful input, which pushed them to rework better while also expanding their self-assurance thoughts. It is suggested that educators provide extra writing practice and interesting writing activities to their students by assigning a variety of topics to help them enhance their writing ability and become more aware of grammatical faults.

## Acknowledgements

The authors would like to thank the reviewers and the editorial board for the comments, feedback, and suggestions given in improving this paper. This study is supported by Research Collaboration Fund (RCF 2021). Reference Number: 600-UiTMCTKD (PJI-RMU. 5/2/1) RCF2020-SS (3/2021)) from Universiti Teknologi MARA Cawangan Terengganu. The authors are also thankful to Pembiayaan Yuran Prosiding Berindeks (PYPB), Tabung Dana Kecemerlangan Pendidikan (DKP), Universiti Teknologi MARA, Malaysia.

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