# Beyond Grammar and Spelling:
# Supporting the Writing Process with Artificial Intelligence Tools

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## Abstract

*Language learners today have access to a variety of free digital tools that can help them with their writing, but they cannot exploit the full potential of these tools unless they are taught how to do so effectively. In our presentation, we will share insights from a project we carried out to explore how AI-based tools can be integrated into teaching writing to students of English at university level. The students who participated in the project (n=66) received peer feedback on one of their writing assignments and then revised it with the help of the free version of Grammarly before submitting their work to their teacher. Once their assignments had been returned to them with their teacher's comments, the students completed a questionnaire on their experiences with the tool. In this article, we will discuss the potential advantages and pitfalls of using AI-based tools for revising student writing as well as the implications of these tools for the teacher's role in the writing process. We will also highlight the importance of training learners to use them efficiently.*

**Keywords:** *Artificial Intelligence (AI) Tools, Process Writing, Learner Training, Teacher Role.*

## 1. Introduction

In this article, we will share insights from a project we carried out to explore how tools based on artificial intelligence (AI) can be integrated into teaching writing to students of English at university level. We argue that learners cannot exploit the full potential of these tools unless they are taught how to do so effectively.

### 1.1 Motivation and rationale

Today there are a variety of free digital tools that promise to improve the users' writing. These tools were not specifically developed for language learning and teaching, but it seems reasonable to assume that they may have benefits for language learners. One such tool is Grammarly, which is advertised on its homepage as going "beyond grammar and spelling" and helping writers to "eliminate errors and find the perfect words to express [themselves]" [1]. In a project carried out with advanced (CEFR level B2+) learners of English as a foreign language, we aimed to evaluate these claims by addressing the following two research questions:

– What are the main strengths and weaknesses of Grammarly from an English Language Teaching (ELT) perspective?
– How can it be used efficiently and meaningfully within a process writing approach in an ELT context?

### 1.2 Grammarly and AI

Grammar checkers have made considerable progress since the first generation of such tools, which relied solely on pattern matching and string replacement (i.e. they could be taught to replace strings such as *isnt* with *isn't).* The more advanced, second generation of grammar checkers were capable of real syntactic processing. Computer programs were programmed with rule-based descriptions of permissible syntax and were thus able to detect ungrammatical elements [2]. Grammarly belongs to the newest generation of grammar checker software, which has progressed beyond merely checking a text for spelling, punctuation, and grammatical accuracy.

As one of the leading AI-based writing assistants, Grammarly also tests stretches of discourse for clarity and effectiveness. Due to its vision to create a "comprehensive communication assistant that promotes true understanding" [3], it also takes context into account by allowing users to define the level of formality, the intended audience, as well as style (e.g. academic, email), intent (e.g. inform, convince), and tone (e.g. neutral, friendly, analytical). All of this is made possible by a system which uses a combination of rules, patterns and AI techniques [4], whereby the term *artificial intelligence*

commonly refers to "the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience" [5].

Some of the AI techniques used by Grammarly's products are machine learning, including deep learning, and natural language processing. Deep learning is a method of machine learning that "teaches computers to do what comes naturally to humans: learn by example. [...] In deep learning, a computer model learns to perform classification tasks directly from images, text, or sound" [6]; natural language processing (NLP) is the "application of computational techniques to the analysis and synthesis of natural language and speech" [7]. If a computer software such as Grammarly is to successfully analyse language, common-sense knowledge of the world as well as the ability to resolve ambiguities and recognize implied meanings are essential. Therefore, NLP can pose a problem for AI systems since statistics and more data might not necessarily help with this kind of analysis [8].
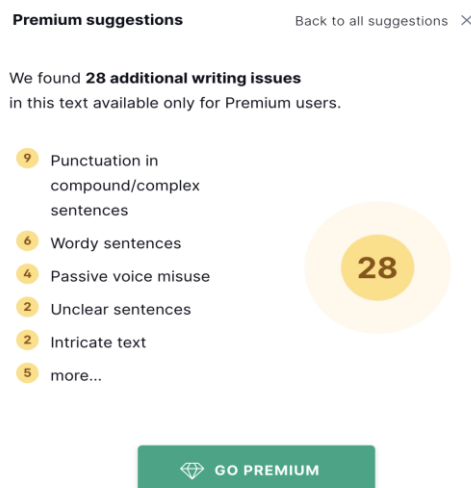
### 1.3 Writing and revisions

Our project was integrated into a first year language course we both teach, putting us in the double role of teachers/researchers. To complete the course successfully, students have to complete two short writing assignments, and these are revised in a process writing approach. Usually, the teacher would provide written corrective feedback on the first draft submitted by the students, and the students would then revise their texts based on the teacher's comments. In our project, we integrated both peer reviewing and revising with Grammarly into the writing process.

As a first step, we assigned a writing task to the students who participated in the project (n=66). They had to write a text of 250-300 words about a current topic which they then gave to a partner (another project participant) for peer review. Students were explicitly told to pay attention to language – specifically, tenses, prepositions, spelling, vocabulary – in their feedback rather than focussing exclusively on the content of the piece of writing. The peer reviewers then returned the texts to the writers for revisions, and the writers were told to make use of the free version of Grammarly to check their partners' corrections and improve their texts. They received the following instructions:

– Mark all corrections suggested by Grammarly on your original printout using two different colours – one colour for the suggestions you decide to reject, and another colour for the suggestions you decide to adopt.
– For the latter category, write your corrections above the highlighted passages on the original printout of your assignment using a pen or coloured marker.
– Experiment with the "premium suggestions" feature and make any further corrections you consider appropriate. Use a third colour to highlight these.

The students were not asked to subscribe to the premium version of Grammarly for the project; they only needed to use the free version. However, as illustrated in Figure 1 below, Grammarly advertises its premium version by teasing "premium suggestions" that are highlighted, but not further explained unless the user pays the subscription fee. A regular, non-premium user is only told the number of mistakes in each premium feature category. These numbers change if the user corrects a mistake successfully, thus providing indirect feedback.



Fig. 1. Example of Grammarly's "Premium suggestions"

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The annotated versions of the participants' original texts were then handed in to and analysed by the teachers/researchers, and the participants received written corrective feedback from the teachers/researchers. When they were assigned their second writing assignment a few weeks later, they were not given any specific instructions as to how to revise it, and they were not explicitly told to use Grammarly again. When the second writing assignment had been completed and corrected, the participants filled in a questionnaire about their experiences with using Grammarly and their approach and attitudes to writing more generally.
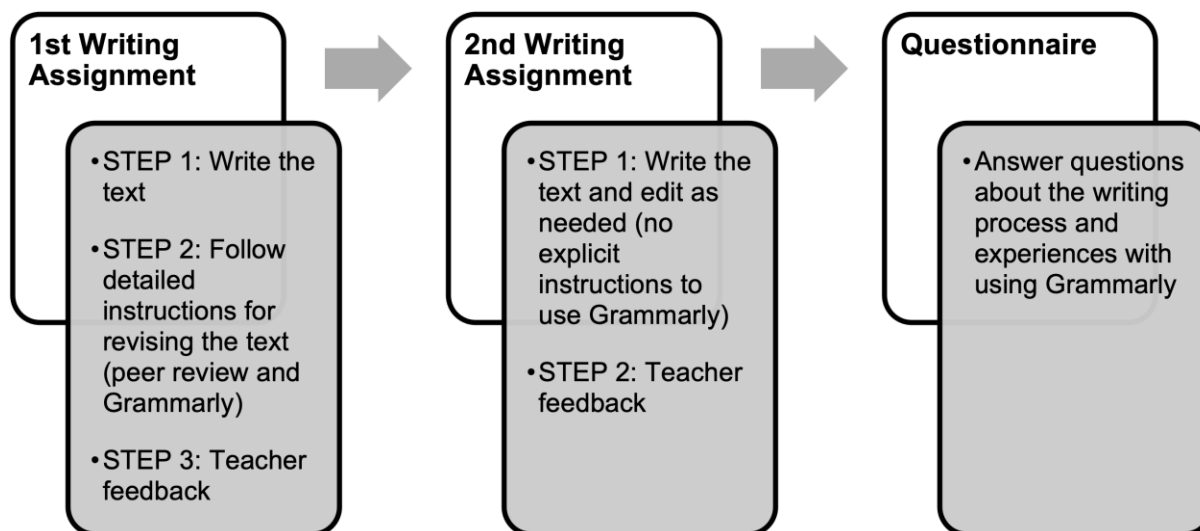
**1st Writing Assignment**

- STEP 1: Write the text
- STEP 2: Follow detailed instructions for revising the text (peer review and Grammarly)
- STEP 3: Teacher feedback

**2nd Writing Assignment**

- STEP 1: Write the text and edit as needed (no explicit instructions to use Grammarly)
- STEP 2: Teacher feedback

**Questionnaire**

- Answer questions about the writing process and experiences with using Grammarly

Fig. 2. Project structure

## 2. Findings

This section analyses Grammarly's strengths and weaknesses for ELT based on the suggestions the project participants reported receiving from the tool and reports the results of the questionnaire.

### 2.1 Grammarly: Main strengths and weaknesses in an ELT context

Our findings suggest that Grammarly performs better in areas of language that follow strict rules (e.g. punctuation, spelling) than in those which depend on meaning (e.g. tense, aspect, collocations, context-dependent spelling).

For example, Grammarly seems to be relatively reliable at improving punctuation, particularly comma placement: as long as the sentences are not overly complex, it suggests adding commas before the start of main clauses, before the sentence relative *which,* and to set off transitional phrases. It also marks commas that are placed incorrectly, for instance before subordinate clauses, before *that*-clauses, or between two main clauses. Furthermore, Grammarly appears to recognize most missing dashes (e.g. \**the so called zero waste* lifestyle). However, it frequently does not suggest appropriate corrections for missing or incorrectly placed possessive apostrophes.

When editing a text with Grammarly, users can choose between different language varieties (American, British, Canadian, and Australian English). Spelling mistakes are then corrected accordingly. As can be expected, Grammarly always marks words which are generally incorrect (e.g. \**devided*). However, if the spelling is context-dependent – that is, if it is a question of word choice rather than spelling – the software performs less consistently. For example, while Grammarly recommends writing *ad**o**pt* (rather than \**ad**a**pt*) *a zero-waste lifestyle,* it does not highlight any mistakes in the phrase \**to a certain extend*.

Along the same lines, Grammarly appears to handle certain areas of grammar more successfully than others. For example, prepositions, articles, adjectives and adverbs, as well as agreement between subject and verb are often corrected effectively. On the other hand, tense mistakes are only recognized if obvious markers are present (e.g. *yesterday, since then).* Grammarly apparently also still struggles with word order in more complex sentences (\**People are finally getting conscious about how big of an ecological footprint **are they** leaving)* and the use of hypothetical language in longer

hypothetical sentences (*If I had to change my life into a zero-waste lifestyle, a lot **had** to change).* No mistakes were detected in either of these sentences.

Where style and register are concerned, Grammarly has certain preferences and tolerances which learners of English should probably be made aware of. For example, passive phrases are frequently labelled as "Passive voice misuse", even in contexts where using passive structures makes perfect sense. Grammarly's software also seems to be geared towards conciseness when either "neutral" or "formal" is selected as the preferred level of formality. Some of the words and phrases that fall into the category of being "wordy" or "unnecessary" are *basically, definitely, in order to,* and *came to the conclusion.* By contrast, the phrase *a lot of* is accepted by Grammarly even if a formal style is chosen. These are corrections that might be at odds with what learners are taught in ELT classrooms.

### 2.2 Students' reactions

According to the results of the questionnaire which the participants completed after experimenting with Grammarly, 80.3% of them had never used this online writing assistant before. Their reaction to it was overwhelmingly positive, with 92.4% of participants stating that using Grammarly had improved their assignment. 54.6% were of the opinion that using Grammarly had led to a noticeable or even significant improvement. 74.8% described Grammarly as more helpful than their peer review partner's suggestions, and 86.2% stated that the results justified the additional effort involved in using Grammarly.

Interestingly, despite these positive results, only 45.5% of participants used Grammarly to review the second assignment they had to complete for the course, in some cases stating that they had simply forgotten about this option. However, 87.9% indicated that they intended to use the tool again in the future.

### 3. Discussion: Implications

Based on the findings of our study, we conclude that AI-based writing tools can be beneficial for learners of English who want to improve their writing, but only if they have a sound knowledge of grammar which allows them to weed out incorrect suggestions made by the tool (as also suggested in [9]). They also have to be familiar with linguistic metalanguage as Grammarly frequently uses terms such as "concise" and "redundant" in its explanations. It should be said, however, that this might be less of a concern in the future as Grammarly is evolving in this regard. Previous versions used even more complex terminology (e.g. "tautology") without the explanations that now accompany the corrections.

As it would be unrealistic to expect even advanced learners of English as a foreign language to possess the level of linguistic and grammatical knowledge required by Grammarly, we argue that the role of the teacher/facilitator is crucial when using what is essentially an editing tool for language teaching (see also [10] for a discussion of the problems of an independent use of Grammarly). Teachers are more aware than learners of the limitations of the tool, such as an inability to deal with the complexities of tense use, and can provide guidance on how to achieve the best results.

The results of the questionnaire also indicate that the participants found automated feedback more useful than peer feedback. This finding is in line with [11], a study of mature learners of English which also found that they were more accepting of automated feedback than of peer feedback. More data would be needed to determine if this preference is due to the quality of the peer feedback the participants received.

### Conclusion

Even though Grammarly was not originally developed as a teaching tool, our findings seem to indicate that learners consider it highly useful for text editing in a process writing approach. However, focused learner training is needed to help learners interpret and evaluate the suggestions provided by the tool. In our increasingly digital world, the benefits of AI tools in a process writing approach appear to be an area worth investigating, especially in light of the rapid evolution of these tools.

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