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Research Article

## Errors in Students' Writing (Reports from ProWritingAid)

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### A B S T R A C T

This research aims to find out the types of students' writing errors which are detected and not by ProWritingAid, a language checker software. This was a qualitative research using a document analysis method with ProWritingAid being the primary language learning instrument to analyze. To collect the data, 18 pieces of students' writing carried out as the experimental task for this research was focused on writing personal letter. These writings were checked in the software, and manually rechecked by the researchers afterward. The results show that ProWritingAid is able to detect 21 types of writing errors including missing pronoun, preposition, and determiner. Meanwhile, there are also undetected errors found, for example, unnecessary capitalization and missing punctuation. In conclusion, ProWritingAid can help students to analyze their errors. However, human analysis is still needed due to the undetected errors.

## INTRODUCTION

Extensive studies have been carried out to investigate students' errors in writing (e.g., Abushihab, 2014; Amiri & Puteh, 2017; Kharmilah & Narius, 2019; Kumala et al., 2017; Nezami & Najafi, 2012; Pohan, 2018; Setyowati et al., 2020; Sumarti & Widodo, 2020; Taher, 2011) with the analysis being conducted manually. This kind of manual analysis, however, may take longer time and resources to do with the potential contribution of during the process (Al-Ahdal, 2020). As such, the use of Artificial Intelligence (AI) writing assistant software to analyze student's errors becomes necessary. In responding to this need, further studies have been put in place, particularly to observe students' writing errors using computer aided error analysis (see Agustin & Wulandari, 2022; Bailey & Lee, 2020; Ismawati et al., 2021; Tambunan et al., 2022; Vidhiasi & Haryani, 2020).

Scientific observations have gone a bit further in comparing the effectiveness of using writing assistant software and human analysis. Park (2019), for example, compared the results between online grammar checker and human raters. For the online grammar checker, he used Grammarly because it is the most user-friendly grammar checker tool and popular for language learners. His findings revealed that some of the feedback given by Grammarly and human raters were comparable while some others were not. In other words, the grammar checker sometimes was successful in identifying the grammatical errors, but some other time was also failed to recognize the major grammatical errors and, thus, provided false feedback.

Dembsey (2017) has also previously conducted a comparative analysis to the errors identified by Grammarly and 10 asynchronous online writing centre consultants with the key findings showing that

Grammarly was intended to deal with advanced grammar pointers, but it resulted in highly technical language and undefined terminology. Grammarly also had a high percentage of inaccuracies with most errors being attributed to its algorithm. Interestingly, some consultants did the same thing in which they used undefined grammatical terms and had content inaccuracies when using these terms, locating errors, and explaining them. However, the consultants could describe grammatical issues and use the students' own words.

As far as online grammar checker is concerned, Grammarly is not the only online tool existed; ProWritingAid is one on the list. Unlike Grammarly, there has been small number of studies looking at the utilization of ProWritingAid to analyze the students' errors in writing. Ariyanto et al. (2019), for instance, investigated students' responses towards the demerits of ProWritingAid through open-ended questionnaire with the findings indicating that the highest percentage were the statement "There were undetected grammatical errors (i.e., wrong tenses usage and subject-verb agreement)" and "There were some errors without the correct version".

This current research aims at conducting further exploration on the ability of ProWritingAid to detect or to identify grammatical errors in students' writing in which the result is expected to help students, teachers, authors, and researchers to consider the use of ProWritingAid in analyzing writing errors. In specific, this research asks "What types of grammatical errors in students' writing are reported and not by ProWritingAid?"

## METHOD

### *Research Design*

This research employed a document analysis method. This was suitable because the researchers identified specified characteristics of the material. In addition, one of the purposes of document analysis in educational research is to analyze types of errors in students' writings (Ary et al., 2010).

### *Participant*

The subject of this research was ProWritingAid. Cited from its official website, ProWritingAid is an artificial intelligence writing assistant software designed for professional authors who want to improve their manuscript before sending it to their editors. The grammar and style checker contains over 3,000 explanations and videos written by experts, so the users do not need to remember all the crazy rules. Nowadays ProWritingAid's users come in many flavours, from best-selling authors to indie writers, from professional copy-editors to rookie bloggers, and from business experts to struggling

students. ProWritingAid also provides a report for every writer. Based on similarweb.com, the total visits of ProWritingAid website are 2.1 million with bounce rate is 63.3%. There are two types of ProWritingAid; Free and Premium. For this research, Free ProWritingAid was used because it does not cost anything and can be used by everyone. It also has provided basic writing suggestions such as grammar, spelling, punctuation, word explorer and thesaurus.

Additional explanation by Perdana and Farida (2019), ProWritingAid is an online editing tool which also emerges to be one of the best writing assistants. What makes this application distinctive from others is in the way of presenting the reports of feedback. This application offers more in-depth reports than other grammar checker tools which help to analyze the text in 20 different reports in order to appeal different users with different strengths and weaknesses in writing. Of the 20 reports, these include style, grammar, overused words, clichés, thesaurus, repeats, length, pronoun, alliteration, transition, diction, and plagiarism. Besides comprehensive reports, the tool also gives scores to each report as well as the overall score, making the writers easier to improve the text. Moreover, ProWritingAid also integrates with other applications like Ms. Word, Open Office, Google Docs, Scrivener, and Google Chrome for the ease of editing.

### *Data Source*

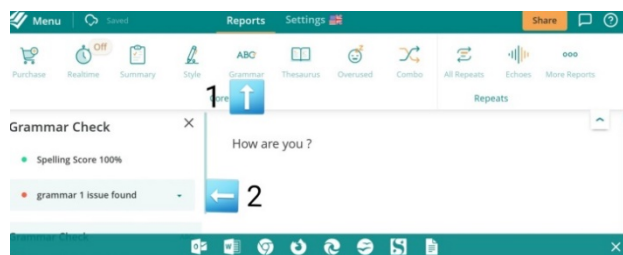
The researchers used 18 pieces of writings as a primary data source. The writings were written by 18 11 graders of State Islamic Senior High School 2 Kuantan Singingi Regency, Riau Province, Indonesia. In this school, English was taught twice a week as a compulsory subject by an English teacher holding a Bachelor Degree in English Language Teaching. During their regular English classes especially in learning Personal Letter topic, the teacher asked the students to write a personal letter under the instruction: "Send a letter to your friend by telling them about your dream university and ask him/her about his/her dream university". They wrote at least 3 paragraphs with 5-10 sentences for each paragraph, in which the writing session took place in 60 minutes.

The researchers chose those criteria because the students had experienced learning English and writing in English when they were in 10th grade students. Before they are in 12th grade students, they can know their writing's errors in 11th grade. The topic of personal letter was chosen because they only need to express their feelings and experiences to the receiver of the letter but they still follow the generic structure of that text. Another consideration is that due to the students' score in English in 10th grade students which consisted of very good,

good, enough, and less level so that the personal letter is not too easy for the very good students and not too difficult for the low students.

**Data Analysis**

In order to analyze the data and get the answer for the research question, first, the researchers input the students' writing into the ProWritingAid. After inputting the students' writing, the researchers clicks the grammar feature on the top and clicks grammar issue found on the left side. To justify this research, the researchers focus on the grammar feature only.



**Figure 1.** Grammar Check

Then, the grammatical errors issued by ProWritingAid will be inputted to the table 1 (The Reported Grammatical Errors). To provide the unreported errors, the researchers did some steps. The first, the researchers focused on the types of grammatical errors which had been reported in Table 1. The second step, when the researchers found the same errors like in Table 1 after inputting the other students' writing to the ProWritingAid but it could not be detected by the software, so the researchers inputted it into Table 2 (The Unreported Grammatical Errors). For example, in one student's writing, ProWritingAid could detect possible unnecessary capitalization, however in other student's writing, ProWritingAid failed to detect it. Again to justify the finding of the unreported errors, although the researchers found other errors, the researchers did not provide it to Table 2 if it was not the same case as Table 1.

**RESULTS AND DISCUSSION**

The results of the reported and unreported types of grammatical errors by ProWritingAid in students' writing were shown through tables.

**Table 1.** The Reported Grammatical Errors by ProWritingAid

No.	Grammar Issues	Total	Percentage
1.	Possible punctuation mistakes	3	3.06%
2.	Missing punctuation	10	10.20%
3.	Possible missing comma	4	4.08%

4.	Missing comma before or after vocative	1	1.02%
5.	Possible comma splice	9	9.18%
6.	Missing comma before coordinating conjunction when it separates two independent clauses	2	2.04%
7.	Missing comma after subordinate clause	2	2.04%
8.	Missing comma after introductory phrase	2	2.04%
9.	Missing comma after prepositional phrase	1	1.02%
10.	The punctuation mark '?' may not require a space before it. Consider removing the space.	11	11.22%
11.	The punctuation ';' may not require a space before it. Consider removing the space.	3	3.06%
12.	The punctuation ':' May not require a space before it. Consider removing the space.	3	3.06%
13.	Possible missing determiner	1	1.02%
14.	Possible confused word	15	15.31%
15.	Unknown word	1	1.02%
16.	Missing capitalization at the start of a sentence	9	9.18%
17.	Possible unnecessary capitalization	8	8.16%
18.	Possible run-on sentence	6	6.12%
19.	Possible missing preposition	4	4.08%
20.	Possible confused preposition	2	2.04%
21.	Possible confused pronoun	1	1.02%
<b>Total</b>		<b>98</b>	<b>100.00%</b>

To answer the research question, "What types of grammatical errors in students' writing are reported by ProWritingAid?" Table 1 showed that 21 types of grammatical errors of students' writing were detected by ProWritingAid. The highest percentage was 15.31%

belonged to possible confused words. ProWritingAid has explained this type of error in its website. It is stated that there are many words that are similar in spelling but have vastly different meanings. If the author uses the incorrect word, the sentence won't make sense.

ProWritingAid has identified some of the most common confused word pairs so the author can correct the writing as necessary. Some of these pairs might just be spelling mistakes. Some might actually be confused words. As always, the author has the power to choose whether you accept a suggestion. If a suggestion makes little sense, the author can simply hit "Ignore" to move on to the next option. Some of the reported examples by ProWritingAid are "We graduated form Junior high school", "We havn't met", and "I really wan to take". The suggestions given are "We graduated from Junior high school", "We haven't met", "I really want to take". From those examples, it can be seen that the words are spelling mistakes and the given suggestions are accepted.

This type of error and suggestion were also reported by Yang (2018). He used SpellCheckPlus as the grammar checker. The example he displayed in the figure was "I checked spelng errors before submitting the assignment". The suggestions available are 23 forms so that the author can choose the appropriate one. However, the report was included into spelling error not grammatical error like ProWritingAid was. To make it sure, the researchers retyped "I really want to take" in ProWritingAid box, it indicated that the issue found is grammatical issue while spelling score is 100% which meant no mistake. Although both ProWritingAid and SpellCheckPlus are online grammar checkers but they have different classification of error. However, they are successful to detect the error which can help the authors to fix their writing.

The errors which had various types were dealing with punctuation. There were 12 types of punctuation errors reported by ProWritingAid with the different total percentage: the punctuation mark '?' may not require a space before it. Consider removing the space 11.22%, i.e. *have you tried to test there ?*; missing punctuation 10.20%, i.e. *I hope you are right()*; possible comma splice 9.18%, i.e. *I miss you very much.(.) I want to tell you about my dream university.*; possible missing comma 4.08%, i.e. *Ayu(.) actually I wrote this letter...*; possible punctuation mistakes 3.06%, i.e. *How are you.(?)*; the punctuation ',' may not require a space before it. Consider removing the space 3.06%, i.e. *Actually, I want to join...*; the punctuation '.' may not require a space before it. Consider removing the space 3.06%, i.e. *I'm interested in listening to the story .*; missing comma before coordinating conjunction when it separates two independent clauses 2.04%, i.e. *I am happy that soon we will graduate(.) but I am also sad because we will separate.*; missing comma after subordinate clause 2.04%, i.e. *even though we can't be together like before(.) I hope you don't forget me*; missing comma after introductory phrase 2.04%, i.e.

*Hopefully you're alright.*; missing comma before or after vocative 1.02%, i.e. *Ayu(.) I also want to inform...*; and missing comma after prepositional phrase 1.02%, i.e. *After graduating(.) which university do you want to go to?*

The errors of punctuation were also detected by Grammarly. It was reported by Kotsyuk (2015). He identified the grammatical errors in the sentences produced by Ukrainian students of English using Grammarly. Grammarly noticed some errors of punctuation. The first was comma misuse within a clause, missing comma after introductory phrase in particular; *In winter(.) we like spending long cold evenings by watching some amazing film or just reading a fascinating book.* The researchers rechecked it in Grammarly. Unfortunately, it needed a premium version. So, the researchers tried to check it in free version of ProWritingAid. The researchers were surprised because the free version of ProWritingAid could detect the error by stating "Missing comma after prepositional phrase" and gave the feedback like what Grammarly did: *In winter(.) we like spending long cold evenings by watching some amazing film or just reading a fascinating book.* It confirmed the students' perception in Ariyanto et al. (2019). They stated, "ProWritingAid is easy to be accessed.". The second was missing comma in a compound sentence; *Poland and Canada helped me to prove my English skills(.) but I know that it is not the end.* The researchers typed the sentence in Grammarly. Again, it needed the premium version. The note given by the Grammarly was punctuation in compound or complex sentence.

Due to the premium version, so the researchers could not know the feedback directly. Same as the previous issue, the researchers checked it in ProWritingAid. No error of punctuation could be detected by ProWritingAid. However, the same issue was detected before. The type of error was missing comma before coordinating conjunction when it separates two independent clauses; *I knew getting in there would be very difficult(.) but at least we have to try right?* As a result, it showed the inconsistency capability of ProWritingAid.

The third was unnecessary comma in a complex sentence; *Some of them I can see every day, because we are studng together, going out and living. We like spend weekends together, as we all study in different cities and do not have possibility to meet more often.* When the researchers rechecked the sentence in Grammarly, it was found that Grammarly failed to detect the punctuation error even Kotsyuk (2015) only stated the sentence without stating the location of error. To ensure the error, the researchers checked it in ProWritingAid. The result was the same as Grammarly. It confirmed the students' perception in Ariyanto et al. (2019) which stated that there were undetected grammatical errors. Finally, the researchers used SpellCheckPlus. It was different because SpellCheckPlus could detect the error. It was written "One does not usually a comma here", *and given the underline in the location of the error*; "Some of them I can see everyday, because we are studng together, going out and living. We like spend weekends together, as we all study in different cities and do not have possibility to meet more

often. The fourth issue was comma splice. This issue was also found by the researcher using ProWritingAid. Kotsyuk (2015) provided the error with the sentence: *My father is a mechanic by profession.(;) he likes reading books and watching television.* The feedback of this error only could be analyzed by using premium version of Grammarly. However, ProWritingAid was superior because it could be detected by free version. The feedback given by ProWritingAid was to change the comma into full stop. Due to the feedback written by Kotsyuk (2015) whom the researcher assumed using premium version, it also indicated no error in ProWritingAid when it was changed into semicolon. The fifth was Incorrect punctuation with quotation mark: *"Family is not an important thing, it's everything(.).".* Unfortunately, the explanation of this issue was available in premium version. When the researcher checked it in ProWritingAid, it was stated that grammar 1 issue found. However when the researcher went to the item, there were no feedback and explanation about the error. It confirmed again the students' perception about ProWritingAid in Ariyanto et al. (2019) which mentioned "There were some errors without the correct version".

The reports also had discovered that errors in capitalization were higher than other errors although it was not the highest one. Two types of errors which occurred were 9.18% of missing capitalization at the start of a sentence (i.e. *have you over told me that you have a dream...*) and 8.16% of possible unnecessary capitalization (i.e. *...i am Fine here...*). The error of capitalization was also reported by Grammarly. For example, Bailey and Lee (2020) displayed the error of capitalization by Grammarly under the convention category and Almusharraf (2020) also reported the capitalization as an error type detected by Grammarly. However, they did not provide the example of the sentence. It differed from Bailey and Lee (2020), Kotsyuk (2015) grouped the capitalization in style errors (i.e. capitalization at the start of a sentence: *that* is my cup of tea.). In addition, Chen et al. (2009) analyzed the students' writing using My Access. The system also could detect the error of capitalization.

Beside capitalization, errors of preposition and determiner were also found in this research. The categories for errors of preposition were possible missing preposition with the percentage 4.08% (i.e. *...don't forget to reply (to) my letter,*) and possible confused preposition with the percentage 2.04% (i.e. *...and excited for (excited about) my college*). While determiner error, it was possible missing determiner with the percentage 1.02% (i.e. *I hope we can join (a) dream university!*). Sahu et al. (2020) evaluated performance of 5 different grammar checking tools; Grammarly, Ginger, ProWritingAid, LanguageTool, and After The Deadline. They evaluated the performance of the tools through 5 types of error; sentence structure error, spelling error, syntax error, punctuation error, and semantic error. The position of preposition error and determiner in terms of article was in syntax error. Other errors also included in syntax error were subject verb agreement, verb form error, noun number error, and preposition error. The examples of error which became the metric of evaluation were *"He has*

*recovered of (from) his illness."* (Preposition error), *"He is not to blame."* (A valid example of agreement between subject and verb), *"(The) Book you want is out of print."* and *"He returned after a (an) hour."* (Article error), *"He paid a sum of money for the informations (information)."* and *"The sceneries here are (The scenery here is) very good."* (Noun number error), and *"She leaves (left) school last year."* and *"The boys are play (playing) hockey."* (Verb form error). The results' evaluation of syntax error found that Grammarly outperformed specifically in syntax error with the highest accuracy then followed by Ginger, LanguageTool, ProWritingAid, and After The Deadline. It meant that ProWritingAid was in the moderate level.

The next error type reported by ProWritingAid was possible run-on sentence with the percentage 6.12% (i.g. *...how are you in Bogor is (Bogor? Is) it true that it is often said...).* Otoshi (2005) used criterion and human instructors to detect the students' errors. The result showed that Criterion could not detect any run-on error while human instructors could detect one error of run-on. The different findings were found by (Chen et al., 2009). Among the 87 errors detected by Criterion, 67 were confirmed by the raters as run-on sentences. The accuracy rate was about 77%. The accuracy rate was high, and false alarms occurred when students used "that is" at the very beginning of a sentence. As mentioned by Yang (2018), SpellCheckPlus also could detect run-on sentences in students' writing assignments. Almusharraf (2020), he analyzed the students' writing using Grammarly and human raters. However, Grammarly could analyze no run-on sentence whereas human raters could analyze 81 of run on sentences. Since this research did not compare the analysis to human raters, the researcher could not provide the comparison. In general, ProWritingAid is still possible to be used because its capability in detecting the run-on sentence.

The last report was possible confused pronoun with percentage 1.02% (i.e. *I'm waiting for you (your) reply.*). The other computer analysis which also could detect the error of pronoun was Grammarly. It was based on Agustin and Wulandari (2022), they found 4.20% of pronoun errors in the students' writing were detected by Grammarly. Deeply, Chen et al. (2009) revealed among the 83 errors of pronoun detected by My Access, only 5 were confirmed by the human raters as grammatically incorrect. The accuracy was only about 6%. Some pronouns were highlighted, but learners might have difficulty understanding why. Unlike ProWritingAid, My Access seemed to not provide the feedback directly. It could be seen from what Chen et al. (2009) wrote about the examples of correct detection as follows: "Sports not only can strong health of us<Pronoun errors (ESL)>, soul in we but also have many benefit.", "Education them<Pronoun errors (ESL)> is more important than just offering them money.", and "After class I usually to ask she<Pronoun errors (ESL)> my questions which I did not understand.". there was no feedback given by My Access. It confirmed the study by Ariyanto et al. (2019) which

found the students' perceptions of ProWritingAid was highly rate for the statement "ProWritingAid helps the students to know, fix, and learn the errors that they made".

**Table 2.** The Unreported Grammatical Errors by ProWritingAid

No.	Grammar Issues	Total	Percentage
1.	Missing capitalization at the start of a sentence	3	25%
2.	The punctuation mark '?' may not require a space before it. Consider removing the space.	1	8%
3.	Missing punctuation	3	25%
4.	Missing comma after prepositional phrase	1	8%
5.	Possible unnecessary capitalization	2	17%
6.	Possible missing comma	1	8%
7.	Possible run-on sentence	1	8%
<b>Total</b>		<b>12</b>	<b>100%</b>

To answer the research question, "What types of grammatical errors in students' writing are unreported by ProWritingAid?" Table 2 showed that 7 types of grammatical errors of students' writing were not detected by ProWritingAid. They were missing capitalization at the start of a sentence (25%), missing punctuation (25%), possible unnecessary capitalization (17%), the punctuation mark '?' may not require a space before it. Consider removing the space (8%), missing comma after prepositional phrase (8%), possible missing comma (8%), and possible run-on sentence (8%). The researcher analyzed the unreported reports based on the types of errors in previous reported results (Table 1). Those reports were not detected by ProWritingAid so that the researcher could not put it in the table 1. However, the types of errors were the same as table 1. The following are the examples of how the errors were detected in Table 1, but it was failed with other sentences. The first was missing capitalization at the start of a sentence; Reported: have you over told me that you have a dream... vs. Unreported: have you tried to test there ?. The second was missing punctuation; Reported: I hope you are right() vs. Unreported: ... I hope you don't forget me(). The third was possible unnecessary capitalization; Reported: ...i am Fine here... vs. Unreported: after graduating From MAN. The fourth was the punctuation mark '?' may not require a space before it. Consider removing the space.; Reported: have you tried to test there ? vs. Unreported: ...which university do you want to got ?. The fifth was missing comma after prepositional phrase; Reported: After

graduating which university do you want to go to? vs. Unreported: After graduating which university do you want to got ?. The sixth was possible missing comma. Reported: Ayu actually I wrote this letter... vs. Unreported: hi ayu how are you there. The last was possible run-on sentence; Reported: ...how are you in Bogor is it true that it is often said... vs. Unreported: how are you there I'm fine here.

It confirmed the previous study from Ariyanto et al. (2019) that one of the students' perceptions related to ProWritingAid was "There were undetected grammatical errors". To respond to this statement, they suggested the English teachers to not using ProWritingAid to EFL students with low English proficiency level as ProWritingAid could not be the best choice to help students with poor sentence construction skill. Thus, the students must have a Basic English Grammar in the first place. In addition, Wahyuda et al. (2022) said, "There are still some shortcomings of the application". The application referred to ProWritingAid. As also mentioned by Al-Ahdal (2020), computers were still lack artificial intelligence perfectly comparable to the human mind so that many software could not deal with learners' unexpected linguistic flaws or innovative constructions as seen in poetic output.

## CONCLUSION

In conclusion, ProWritingAid especially the free version can help students to analyze their errors. However, human analysis/teacher's feedback is still needed due to the unreported errors. The reported reports only stated the errors based on what ProWritingAid provided specifically in grammatical issues. For the unreported reports, the researcher didn't involve the raters so that the reports were limited. It is much recommended for future research to compare between ProWritingAid reports and rater analysis reports to get deeper explanation about the errors. It is also recommended to use the premium version of ProWritingAid since it might give different results. Conducting the further research using different text type is highly expected.

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