THE EFFECT OF PROWRITINGAID AS ARTIFICIAL INTELLIGENCE (AI) ON STUDENT'S ENGAGEMENT

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Abstract

Technology has developed rapidly and people need to adapt to this development. One of them is a technology called artificial intelligence. In the education field, the utilization of artificial intelligence is needed for students. Therefore, this current study aimed to determine whether using *ProWritingAid* as artificial intelligence affects student engagement. This current study was conducted as pre-experimental research with one group pretest-posttest design. The second-semester English language education students were selected by the researchers as the sample through the total sampling method. Data was gathered through pre-questionnaires as well as post-questionnaires. The questionnaire results were used to score student's engagement. Based on the result finding, The mean score pre-questionnaire was 56.62 and post-questionnaire was 62.62. Moreover, the result data analysis on the Wilcoxon-Signed Rank Test revealed the sig (2-tailed) of $0.000 < 0.05$. Simply, the null hypothesis (Ho) is rejected, whereas the alternative hypothesis (Ha) is accepted. Thus, a conclusion can be made that the application of *ProWritingAid* positively and significantly affects student engagement. Additionally, further researchers can investigate the use of *ProWritingAid* with other artificial intelligence tools so that can be seen as the most effective application to be used.

Keywords: Technology, ProWritingAid, Artificial Intelligence, Student Engagement

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Introduction

Recent technological advancements have significantly impacted various fields, including education, where they have transformed the teaching and learning of EFL. Students now have access to various online language learning tools that are easily accessible to enhance their learning experiences. These tools can assist teachers in evaluating students' performance, enhancing the effectiveness and efficiency of learning. Lim & Phua (2019) highlighted that digital tools effectively boost students' capabilities and foster positive responses in educational environments.

One technology that has been frequently mentioned in the past few years, with the contribution to significant advances as well as delivering outstanding outcomes is Artificial Intelligence, most commonly known as AI. According to Fitria (2021), AI refers to a computer-based simulation of the intelligence of humans which is designed to perform similarly to humans. Moreover, O'Connor (2023) added, that artificial intelligence can be described as the replication of human-like intelligence in machines that imitate how humans think and behave through advanced programming. From these explanations, it can be concluded that artificial intelligence results from developments in computers that allow computers to perform the ability similar to those performed by humans.

Along with the adoption and usage of new technologies in education, the utilization of artificial intelligence is also getting more and more common in the education field. Incorporating artificial intelligence into the education system will change how students learn, how teachers teach, and how institutions function. In line with that statement, Phan (2023) stated that artificial intelligence is capable of not only personalizing teaching and learning but also of allowing students to learn independently while assisting teachers in evaluating and tracking student progress. Thus, it has been proven that artificial intelligence is an effective tool for controlling the quality of student learning and enables students to view and track their progress regularly.

In the writing classroom, it is essential to apply AI-based feedback to students' writing, which is important in work. AI feedback allows students to get a quick evaluation of the lexicon, grammar, cohesion, and text structure used in their writing (Barrot, 2023). This helps students to identify the areas in which they need improvement in their writing ability. Moreover, AI feedback provides an objective view by assisting students to overcome overly subjective assessments (Bakti et al., 2023). In addition, AI feedback also reduces the workload of teachers. AI feedback helps teachers improve

efficiency in the process of integrating. The integration of AI feedback is developing students' writing skills and accelerates the learning process.

ProWritingAid is one of the best tools for providing feedback in English writing. It is among the applications categorized as an artificial intelligence-powered digital writing tool. *ProWritingAid* is a database-driven application that automatically edits writing (Aboulfotoh, 2024). This app, besides having the ability to correct grammatical errors found in writing, also has a variety of other features. This includes detecting plagiarism and assessing a text by considering various elements of writing, such as language structure, spelling, style, repetitive word usage, and readability. According to Ariyanto et al. (2019), *ProWritingAid* enhances students' writing quality by refining grammar, spelling, and various elements. Identified errors are indicated through underlines or highlights. Overall, *ProWritingAid* is an effective AI tool that can engage students in writing activities and enhance the learning experience.

Furthermore, it is believed that using technology, such as *ProWritingAid*, would increase student engagement. For the learning process to be successful, especially when studying a foreign language such as English, student participation is crucial (Anjarwati & Sa'adah, 2021). Utilizing *ProWritingAid* in writing class, especially in English language teaching, can significantly enhance learners' active involvement and direct engagement. As stated by Wahyuda et al. (2022), teachers need to use various methods, learning resources, and technology within the classroom to foster an engaging learning atmosphere. *ProWritingAid* enables teachers to instruct students in self-assessing their writing without relying on the teacher because these apps provide real-time feedback toward students' writing tasks. As a result, students can learn from their errors and eventually engage in active and independent learning.

Establishing an engaging classroom environment is crucial for fostering students' enthusiasm and participation in English writing activities. According to Sumarno & Shodikin (2017), engagement itself reflects an individual's active participation in a task or activity. The involvement here could be behavioral, emotional, or cognitive involvement. Behavioral involvement could include positive practices, involvement in academic tasks, as well as active participation in activities related to school. Emotional could include the affective reactions of the students in class, meanwhile, cognitive involvement could include adaptability in solving problems, inclination towards hard work, as well as positive coping when facing setbacks (Fredricks et al., 2004).

Numerous research has dealt with the use of *ProWritingAid* in writing education. Studies conducted by (Fitria, 2023; Wahyuda et al., 2022) showed that the *ProWritingAid* application was proven effective in enhancing students' writing quality. It can detect various writing errors, such as accuracy in grammar and spelling, and provide features to check plagiarism and measure readability. Further, Nasution & Fatimah (2018) showed that *ProWritingAid* enables students to learn and edit their writing independently, which ultimately contributes to improving students' writing in the classroom without direct teacher intervention. Considering those studies investigated the use of *ProWritingAid* in learning, very few specifically address the relationship between *ProWritingAid* and student engagement. Therefore, this current study seeks to find unexplored areas within the literature by investigating the effect of *ProWritingAid* AI in teaching English, specifically in the field of writing. The question aimed to be answered by the conduct of this study was whether P*roWritingAid* significantly affects student engagement or not.

Research Method
Design
This study employs a quantitative approach, focusing on the analysis of numerical data to conclude gaining an in-depth comprehension of *ProWritingAid's* effect as AI on students' engagement in the paragraph writing class. It is presumed that a pre-experimental design was employed in this study as the research method, with one group pretest-posttest research design. Here, the researchers were interested to know the variables' relation and tried to determine whether these variables were correlated. Student engagement was the dependent variable, with *ProWritingAid* as the independent variable.

Participants
This research took place at the University PGRI Jombang. The population in this study is English education students at PGRI Jombang University at the undergraduate level, which consists of 240 students. Therefore, In conducting this study, the researchers use a purposive sampling technique, which is classified as non-probability sampling. The researchers select purposive sampling based on convenience, and the respondents are chosen because they are in the fit circumstance of the research to be performed by the researchers. In this study, the sample used as the subject is English Education Students of 2023 in a paragraph writing class that consists of 29 students.

Instrument

In this study, the students' engagement questionnaire is used as a research instrument to gather the data. The questionnaire consists of a pre-questionnaire and a post-test questionnaire. As stated by Fredricks et al. (2004), student engagement has 3 dimensions namely, behavioral, emotional, as well as cognitive. In this research, the questionnaire was adapted from (Arianti, 2019).

Data Collection

The procedure for collecting the data and conducting the research involved several steps. First, in the preparation stage, the questionnaire was created in Bahasa Indonesia to ensure that the students could understand and answer it easily. It was then reviewed and validated by an expert validator. Next, during the administration stage, the researchers transferred the questionnaire statements to a Google Form and distributed the link to students through a WhatsApp group. Finally, in the collection stage, the completed questionnaires were gathered for quantitative analysis.

Data analysis

The questionnaire data was transformed into the total student engagement score. Then, the pre-questionnaire and post-questionnaire results data were analyzed with the use of the SPSS 2.1 Windows program. After the completion of the pre-test, treatment, as well as post-test procedures, the researcher carried out a statistical analysis of the data. Before conducting the hypothesis testing, there is a test requirement that must be carried out, namely the normality test. The researcher analyzed this study's data using the Wilcoxon Signed Rank test as a comparison of the difference between the two means of one paired sample, and it was used because the data was not normally distributed.

Results and Discussion
Results

In this research, the researchers used the Wilcoxon Signed Rank. The Wilcoxon Signed Rank is a test to determine if there is a significant difference between the two means of student engagement before and after being taught with *ProWritingAid*.

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-Questionnaire	29	22	72	56.62	9.100
Post Questionnaire	29	52	72	62.62	6.002
Valid N (listwise)	29				

Referring to Table 1, the output above shows the total of respondents is 29 (N) and there is a significant increase mean score of students' engagement, before and after treatment using *ProWritingAid*. The mean score before the treatment is 56.62, with the max score at 72 and the min score at 22. The mean score after the treatment is 62.62, with the max score at 72 and the min score at 52. Thus, it can be interpreted that the mean score after treatment was higher than before the treatment by a difference of 6.00. it is an indication that an improvement occurred in the mean score of student engagement before and after the treatment.

Table 2. Wilcoxon Signed Ranks Test

		N	Mean Rank	Sum of Ranks
Post Questionnaire - Preliminary Questionnaire	Negative Ranks	0[a]	.00	.00
	Positive Ranks	27[b]	14.00	378.00
	Ties	2[c]		
	Total	29		
a. Post Questionnaire < Preliminary Questionnaire				
b. Post Questionnaire > Preliminary Questionnaire				
c. Post Questionnaire = Preliminary Questionnaire				

Referring to table 2 above, presented that the Wilcoxon Signed Ranks Test analysis demonstrated that: Negative ranks mean that samples with post-questionnaire scores are lower than preliminary questionnaire scores. In this study, there were 0 samples; Positive ranks mean samples with higher post-questionnaire scores than preliminary questionnaire scores. In this study, there were 27 samples; Ties means that the post-questionnaire score is equal to the preliminary questionnaire score. In this study, there were 2 samples; The Mean Rank for Positive Ranks from the pre-questionnaire to the post-questionnaire is 14.00. in contrast, the Mean Rank for Negative Ranks from the preliminary questionnaire to the post-questionnaire is 00.00. While the number of Positive Sum of Ranks is 378.00, the number of Negative Sum of Ranks is 00.00.

Table 3. Test Statistic

	Post Questionnaire - Preliminary Questionnaire
Z	-4.549[b]
Asymp. Sig. (2-tailed)	.000
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

As can be seen in Table 3, the asymp.sig (2-tailed) value is 0.000 where it is below sig value < 0.05, then it indicates the null hypothesis (Ho) is not accepted, whereas the alternative hypothesis (Ha) is accepted. A conclusion can be drawn that a significant difference occurred between before and after using *ProWritingAid* in the preliminary questionnaire and post. So, it can be said that there is an effect of the use of the *ProWritingAid* on student engagement. Thus, this application is indeed appropriate to be applied to increase student engagement.

Discussion

This study's findings demonstrated that *ProWritingAid* effectively enhanced student engagement, as it enabled students to actively participate in learning, analyze their errors, and revise their content through writing. This finding was reinforced by Ariyanto et al. (2019), who showed that the ProWritingAid application enabled them to learn, rewrite, and enhance student's descriptive paragraphs using *ProWritingAid* and teacher comments. By using *ProWritingAid*, students can understand and fix their errors using the program's explanations, particularly in areas such as grammar, vocabulary, and spelling.

As in previous research, it is important to consider the dimensions of student engagement: behavioral, emotional, as well as cognitive. In the behavioral domain, it is revealed by the findings that using *ProWritingAid* changed students' behavioral engagement in the classroom, particularly in terms of their involvement, interaction, attention, performance, and effort in learning English. The survey revealed that using *ProWritingAid* can enhance students' behavioral engagement, likely because it helps students become more accustomed to learning and improves their abilities in specific areas by employing targeted learning strategies. This statement is supported by Perdana & Farida (2019), about the feature of *ProWritingAid*, providing more detailed reports compared to other grammar checkers, which assists in analyzing the text in 20 separate reports to suit users with varying writing strengths as well as weaknesses. Fitria (2021), also added that this kind of artificial intelligence helps students acquire the cognitive abilities to comprehend writing mechanics and complete their writing tasks free of grammatical errors.

In the emotional domain, students must be continuously encouraged to increase their motivation. This aspect relates to students' interests and values, resulting in boredom, happiness, sadness, or anxiety, including friends, teachers, or lessons given (Bond, 2020). The use of *ProWritingAid* appears to have positively impacted students compared to before; they

enjoyed and showed greater interest in learning through the program. It sparked their curiosity and made the learning experience more enjoyable. Although many students lack motivation to write, *ProWritingAid* can increase their motivation. Several internal and external factors often contribute to this issue, such as limited vocabulary or monotonous teaching methods. *ProWritingAid* can address these problems by offering alternative words to expand students' vocabulary. This self-directed learning approach can also help prevent boredom by making the learning process more engaging. Moreover, Fitria (2023) added that students will develop greater interest, comprehension, and writing skills using *ProWritingAid*.

In the cognitive domain, students must have strong confidence to achieve the goals set. Related to a previous study by Ariyanto et al. (2019) which highlighted *ProWritingAid's* positive impact on students, this research further confirms that students view *ProWritingAid* as a valuable digital tool for the writing process. This finding strengthened the statement that English Education 2023 students of PGRI Jombang University were dedicated and kept trying to improve their writing while participating in classes using *ProWritingAid*. Possessing student engagement in the present study were given opportunities to reflect on the techniques they use to solve problems and determine the effectiveness of a particular set of problem-solving strategies in achieving their goals. This is evidenced in the improvement in mean score before and after treatment with *ProWritingAid*.

Conclusion

Regarding the study's problem statement, the current research's purpose was to investigate how *ProWritingAid* affects students' engagement. From this study's results, the researcher could conclude that a significant increase occurred in the average score of students' engagement before and following the treatment using *ProWritingAid* on the mean score. The pre-questionnaires resulted in a mean score of 56.62, and the post-questionnaire resulted in a mean score of 62.62. This is proven by looking at the Wilcoxon-Signed Rank Test, which demonstrated the asymp.sig (2-tailed) value of $0.000 < 0.05$. A conclusion can be drawn that the *ProWritingAid* as artificial intelligence affects students' engagement. Additionally, the use of *ProWritingAid* in conjunction with other artificial intelligence tools could be explored by future researchers to identify the most effective applications. This would involve analyzing why certain applications are more effective than others.

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