



Employing Wordvice Artificial Intelligence to Instruct on English Subject-Verb Agreement

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Abstract: Subject-Verb Agreement in English is a fundamental aspect of grammar that must be learned in the English Department at UIN Ar-Raniry Banda Aceh. One of the media that can be used as an assistant to instruct on English subject-verb agreement is using artificial intelligence. The objective of this study is to ascertain if it can influence students' learning results. This research employed a quantitative approach utilizing a pre-experimental design. The sample comprised 22 students from an intermediate grammar class, from a total population of 183 in batch 23. Data gathering employed pre- and post-assessments. The researcher utilized SPSS Version 27.0 for data processing. The findings indicated that the use of Wordvice artificial intelligence influenced grammar instruction and students' learning outcomes. The students' pre-test mean score was 33.64, with a standard deviation of 15.975, whereas the post-test mean score was 53.41, accompanied by a standard deviation of 17.48.

Keywords: Employing wordvice, artificial intelligence, subject-verb agreement.

Received May 10, 2025; **Accepted** August 18, 2025; **Published** October 31, 2025

Citation: Mardhatillah, J. (2025). Employing Wordvice Artificial Intelligence to Instruct on English Subject-Verb Agreement. *Journal of Innovation in English Education and Language Teaching*. 2(1). 1–14.

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INTRODUCTION

Currently, technology is extensively utilized in education by both students and instructors. Technology offers several advantages for both students and educators. The advantages of technology in education for students and learners encompass several aspects, including enhanced support for learners and connectivity through online platforms. A prevalent topic of discussion currently is artificial intelligence (AI). Artificial intelligence enables machines to do certain tasks that need human intellect, such as reasoning and comprehension (Bengaluru et al., 2022). Artificial intelligence implemented in education will significantly affect students' learning. Artificial intelligence in education offers new opportunities, capabilities, and challenges to educational processes. Artificial intelligence has enhanced educational practices, including the assessment of student work, grade allocation, and provision of assignment feedback using computer programs.

Technology has become an integral component of the language acquisition process. It enhances student motivation, promotes comprehension, and fosters collaborative abilities. Technology empowers students to acclimate to the learning process by utilizing various technologies that assist educators in facilitating language acquisition. Syafitri et al. (2022) assert that educational resources have been accessible via smart gadgets. Technology facilitates the provision of many resources to students, including online textbooks, films, podcasts, and quizzes. The materials available on internet platforms can enhance students'

language abilities, particularly writing, by offering many formats and styles, correcting grammatical errors, paraphrasing, and more. Students that employ technology in their writing process can enhance the quality of their work.

The writing difficulties of students in the English language have emerged as a significant concern in higher education. During the writing process, students may face many writing obstacles that impede their ability to produce quality work. Students encounter a range of writing challenges, including spelling, grammar, punctuation, word order, and idea generation issues (Utami et al., 2023). Moreover, Rahmatunisa (2014) asserts that pupils face three challenges in the process of learning to write. These issues involve linguistic, cognitive, and psychological dimensions. Linguistic concerns pertain to

grammar and vocabulary, cognitive problems encompass spelling and punctuation, while psychological elements are associated with motivation and confidence. Technology might potentially be employed to enhance pupils' writing skills in relation to many sorts of hurdles.

Artificial intelligence technology has been employed to enhance the quality of writing. Examples of artificial intelligence software include Grammarly, Quillbot, Google Translate, and Wordvice AI, among others. Diverse AI writing assistance packages emphasize various areas. For example, Grammarly and Quillbot are two types of artificial intelligence technologies that assist students in rectifying errors in grammar and sentence structure. Google Translate is an artificial intelligence application that assists students in identifying suitable words for their phrases according to the situation. Typically, a single AI solution does not address all facets of grammar. This study utilized an AI known as Wordvice. This tool aids users in identifying spelling, grammatical, and punctuation mistakes.

Several academics have already undertaken investigations on artificial intelligence writing tools. A study conducted by Ginting et al. (2023) examined the usage of artificial intelligence tools for writing among English Foreign Language (EFL) students. This study employed a mixed-method approach, integrating both quantitative and qualitative techniques. His research employed Grammarly and Quillbot as artificial intelligence tools. A subsequent investigation was performed by Zulfa et al. (2023). Her study concentrated on the usage of technological tools by students and their effect on writing skills. The intriguing findings revealed that pupils utilized many technological tools simultaneously. Her research employed many AI technologies, including Grammarly, Quillbot, and Smodin. The study by Inderawati (2019) indicates that students effectively generated ideas in text by utilizing AI technologies that offer comments and suggestions.

This research aims to assess the use of artificial intelligence technologies, following the aforementioned study. This research using Wordvice artificial intelligence to instruct on English subject-verb agreement through a quantitative methodology, differing from other studies. Numerous prior studies have employed artificial intelligence and qualitative methodologies in their study on artificial intelligence in education, although there has been a lack of subsequent research utilizing quantitative methods in this domain. PBI students may assess the influence of artificial intelligence on their learning results, since they will be the future educators employing this technology in their pedagogical practices

METHODS

Halloway (2005, p. 293) asserts that methodology illustrates a theoretical framework and notion that underpin techniques and processes. The research technique is a strategy employed to collect information in order to answer certain questions elaborated upon later. This area encompasses study design, research participants, data collecting, and data analysis.

Research Design

Research design constitutes a comprehensive framework and methodology for investigation, encompassing judgments ranging from overarching assumptions to specific techniques for data collection and analysis. The researchers gather and examine numerical

data employing a quantitative approach. Creswell (2012) asserts that this technique evaluates ideas by analyzing the correlation between two variables. The researchers seek to determine the effect of Wordvice AI on students' learning results.

Quantitative research encompasses several study designs, including experimental, quasi-experimental, correlational, and survey designs. This study employs a pre-experimental design, which, according to Creswell (2015), is a conventional method for executing quantitative research. Creswell (2017) delineates four categories of pre-experimental designs: one-shot case study, one group pre-test and post-test, and post-test alone with nonequivalent groups design.

The researchers evaluate the use of Wordvice artificial intelligence in instructing subject-verb agreement using a one-group pre-test and post-test methodology. This pre-experimental approach evaluates the same cohort of participants prior to and after to the intervention. The pre-test assesses students' comprehension of subject-verb agreement prior to use Wordvice AI, and the post-test evaluates their understanding after its use.

Population

Sugiyono (2019) defines a population as a generalizable region comprising individuals who possess specific traits that the researcher intends to investigate. The researcher employed sampling methodologies to ascertain the sample. The subject of this research comprises the students enrolled in the English Language Education Department at UIN Ar-Raniry. The researchers delineate the quantity of undergraduate students, encompassing those in cohort 2023, amounting to 183 students.

Sample

Arikunto (2019) states that if the population is fewer than 100, the sample should encompass the whole population. If the population exceeds 100 individuals, a sample of 10-15% or 20-25% may be selected from the population. Utilizing the aforementioned selection procedure, the researcher selected one unit from batch 2023, including 22 students, which constitutes 12% of the population.

Data Collection Protocol

The researcher use a tool to gather data. Arikunto (2000) asserts that data collecting instruments are tools that assist researchers in the acquisition of data, hence simplifying the process. The research tool employed may be a test. This research employs a quantitative methodology and a pre-experimental design.

A pre-experimental research approach is employed to investigate the causal link between independent and dependent variables. The researcher controls the independent variable, whereas the dependent variable is assessed as the outcome of the experiment (Loewen & Plonsky, 2016). In this study, the researcher used the tables of a single group's pre- and post-assessments. Table 1 The Table of Pre- and Post-Tests in a Single Group Design.

Table 1. The Table of Pre- and Post-Tests in One Group Design

Group	Pre-test	Treatment	Post-test
Experimental	T1	X	T2

(Creswell, 2017)

a) Pre-test

A pretest is a test that is administered before the treatment process to determine the students' understanding of the particular topic before the treatment is conducted.

b) Treatment

Treatment is the process of teaching and learning using Wordvice artificial intelligence. The researcher will conduct the treatment 3 times after the pre-test is conducted.

c) Post-test

A post-test is a test that administered after the intervention. Post-test is done to know the final scores and measure the difference between their scores before and after receiving the treatment.

d) Comparing the results between pre- and post-tests

The comparison between pre- and post-tests are used to know whether using Wordvice AI can be impact on students' learning outcomes.

Data Analysis Procedure

After collecting data using the provided research instruments, the next crucial stage for researcher is data analysis, In quantitative research, numerical data obtained from the field can be formulated and analyzed using statistical methods. Researchers commonly employ paired sample test using the SPSS software to assess improvement and draw conclusions.

1) SPSS

According to Bevan (2020), "the SPSS (Statistical Package for the Social Sciences) is a software commonly used for statistical analysis to analyze the data". In this study, the researcher uses a SPSS software to calculate numerical data from pre- and pos-tests. The data was taken from the students' tests results which is conducted before and after being treatment.

2) Students' Correct Answer Formula

$$\text{Total Grade} = \frac{\text{Total Corrects}}{\text{Total Questions}} \times 100$$

(Brown & Abeywickrama, 2004)

RESULTS

This section examines students' scores and the average of total results from both pre- and post-tests. The study included 22 participants, all of whom were students in the English Language Education Study Program.

Descriptive Statistical Analysis

Prior to the therapy, the researcher assessed participants' comprehension of subject-verb agreement using multiple-choice questions administered via Google Forms. Upon completion of the therapy, the researcher administers a post-test to assess the students' outcomes after instruction facilitated by Wordvice artificial intelligence.

Preliminary Assessment

The pre-test has 20 questions about subject-verb agreement and provides indications to ascertain the questions. Specifically, solitary and multiple forms, simple present, simple past, present perfect, and past perfect tenses. The purpose of the pre-test is to assess the extent of pupils' comprehension.

Students' performance and categorization

The researcher undertook numerous procedures to comprehend and interpret the data: evaluating each student's test score, computing the mean, standard deviation, and other statistical elements as supplementary sources. The pupils' pre-test scores are presented in the table below.

Table 2. The Score of Students' Pre-Test

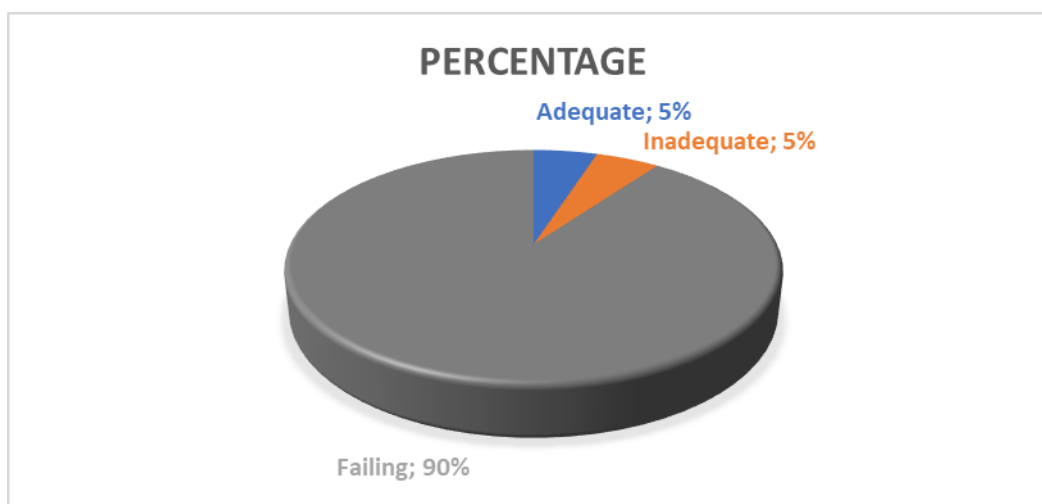
No	Students' Initial	Score	Classification
1	TF	60	Inadequate
2	MAZ	75	Adequate
3	YM	70	Adequate
4	ZA	35	Failing

No	Students' Initial	Score	Classification
5	I	65	Inadequate
6	LPN	55	Failing
7	NHG	60	Inadequate
8	MZR	50	Failing
9	RA	70	Adequate
10	SS	60	Inadequate
11	SH	30	Failing
12	MM	45	Failing
13	ALS	50	Failing
14	NZZ	30	Failing
15	FY	85	Good
16	ARHQ	25	Failing
17	AI	35	Failing
18	N	85	Good
19	AK	60	Inadequate
20	ANR	35	Failing
21	QUY	50	Failing
22	M	45	Failing
Total		1175	Failing
Mean		53.41	

According to the Table 4.1 above, it presents specific information about the pre-test, there were 22 samples in the experiment, and their overall score was 740. In addition, the mean score was 33.64, which indicates that this pre-test was in the failing category according to Brown and Abeywickrama's score classification. Most students were considered failing, with only one person was inadequate, and adequate. After tabulating and assessing the students' pretest score, the percentage will be displayed in the format indicated by the table below.

Table 3. The Results' Percentage of Students' Pre-Test Score

Score	Number	Percentage	Classification
90 – 100	-	0%	Excellent
80 – 89	-	0%	Good
70 – 79	1 student	5%	Adequate
60 – 69	1 student	5%	Inadequate
Below 60	20 students	90%	Failing
Total	22 students	100%	

**Figure 1.** Percentage of the Students' Pre-Test Score

According to the statistical results above, there were 22 students (100%) in total, with 20 students (90%) classified as failing, one student (5%) classified as inadequate and adequate, and zero students (0%) for excellent and good classification.

Mean Score and Classification

The researcher used a pre-test to assess students' understanding on subject-verb agreement before administering the treatment. Furthermore, the pre-test was designed to determine what level they were at. The table show below shows the students' pre-test mean score and standard deviation.

Table 4. Mean and Standard Deviation Score

Mean	Standard Deviation
33.64	15.975

The table above present the students' pre-test score and standard deviation. The mean score obtained by the students was 33.64, with a standard deviation of 15.975, which is less than the mean, indicating significant variation in the students' pre-test scores and different levels of understanding regarding subject-verb agreement before the treatment was administered.

Normality Test

Normality tests are used in statistics to determine whether a data is well-modeled by a normal distribution and to assess the probability that the data set's underlying random variable is normally distributed. The Shapiro-Wilk technique was employed in this study to evaluate normality. The normality has been tested using SPSS 27.0 for Windows, and the results are presented in the table below.

Table 5. Test of Normality of Students' Pre-Test Score

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	.167	22	.113	.915	22	.061

Lilliefors Significance Correction

The table above presented the information about tests of normality focus on Shapiro-Wilk test, the significant value of the experimental class's pre-test learning outcomes is 0.061, implying that H_0 is accepted. The researcher can conclude that the pretest data follows a normal distribution based on the test results.

Post-test

The total number of post-test questions is the same as the pre-test questions but there are 3 questions that have been replaced and all the numbers have been randomized. The indicators remain the same based on singular and plural, simple present, simple past, present perfect, and past perfect tense.

Students' Score and Classification

The researcher used multiple-choice questions with five answer choices in the same manner as the pre-test to collect data, and followed several steps to understand and analyze the data: grading each students' test score, calculating the mean, standard deviation, and other statistical aspects as a supporting source. The students' score post-test can be seen in the table below.

Table 6. The Score of Students' Post-Test Score

No	Students' Initial	Score	Classification
1	TF	60	Inadequate
2	MAZ	75	Adequate
3	YM	70	Adequate
4	ZA	35	Failing
5	I	65	Inadequate
6	LPN	55	Failing
7	NHG	60	Inadequate
8	MZR	50	Failing

No	Students' Initial	Score	Classification
9	RA	70	Adequate
10	SS	60	Inadequate
11	SH	30	Failing
12	MM	45	Failing
13	ALS	50	Failing
14	NZZ	30	Failing
15	FY	85	Good
16	ARHQ	25	Failing
17	AI	35	Failing
18	N	85	Good
19	AK	60	Inadequate
20	ANR	35	Failing
21	QUY	50	Failing
22	M	45	Failing
Total		1175	Failing
Mean		53.41	

The table above present specific information about the pos-test, there were 22 samples in the experiment, and their overall score was 1175. In addition, the mean score was 53.41, which indicates that this post-test was in the failing category according to Brown and Abeywickrama's score classification. After tabulating and assesing students' pos-test score, the percentage will be displayed in the format indicated by the table below.

Table 7. The Results' Percentage of Students' Post-Test Score

Score	Numbers	Percentage	Classification
90 – 100	0	0%	Excellent
80 – 89	2	9%	Good
70 – 79	3	13%	Adequate

60 – 69	5	23%	Inadequate
Below 60	12	55%	Failing
Total	22	100%	

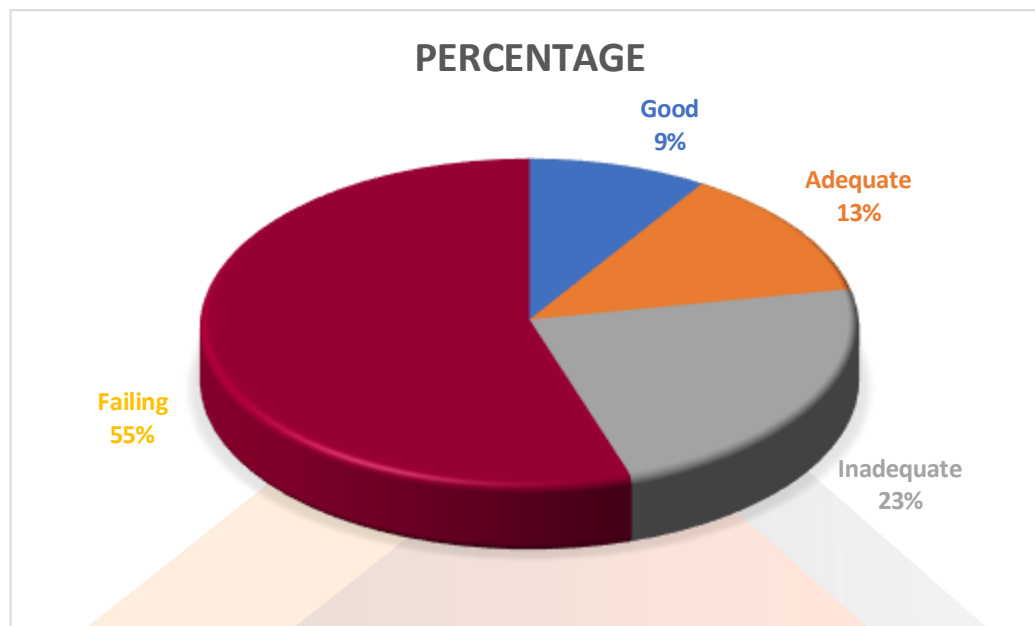


Figure 2. Percentage of the Students' Post-Test Score

According to the results above, there were 22 students (100%) in total, with 12 students (55%) classified as failing, five students (25%) classified as inadequate, three students (15%) classified as adequate, and two students (10%) classified as good.

Mean Score and Classification

The researcher used a post-test to assess students' understanding on subject-verb agreement after conducted the treatment. Furthermore, the post-test was designed whether the students were on different level. The table shows the students' post-test mean score and standard deviation.

Table 8. Mean and Standard Deviation Scores

Mean	Standard Deviation
53.41	17.484

The table above present the students' post-test score and standard deviation. The mean score obtained by the students was 53.41, with a standard deviation of 17.484. This indicates that the standard deviation is relatively lower than the mean, indicating significant variation in the students' post-test scores and different levels of understanding regarding subject-verb agreement after the treatment was administered.

Normality Test

Table 9. Test of Normality of Students' Post-Test Score

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Posttest	.127	22	.200 [*]	.960	22	.488

Lilliefors Significance Correction

Based on the table above, the experimental class's post-test learning outcomes have a significant value of .488, greater than 0.05, meaning that H_0 is accepted. According to the test results, the post-test data has a normal distribution.

Test of Significance (Paired Sample Test)

The researcher used data analysis to identify the difference in students' scores before and after being treated with Wordvice artificial intelligence. Because the data was normally distributed, the researcher used the paired sample test. The researcher analyzed the data using SPSS 27.0 Version. The following table shows the results:

Statistics of Paired Sample Test

Table 10. The Results of Paired Sample Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	33.64	22	15.975	3.406
	Posttest	53.41	22	17.484	3.728

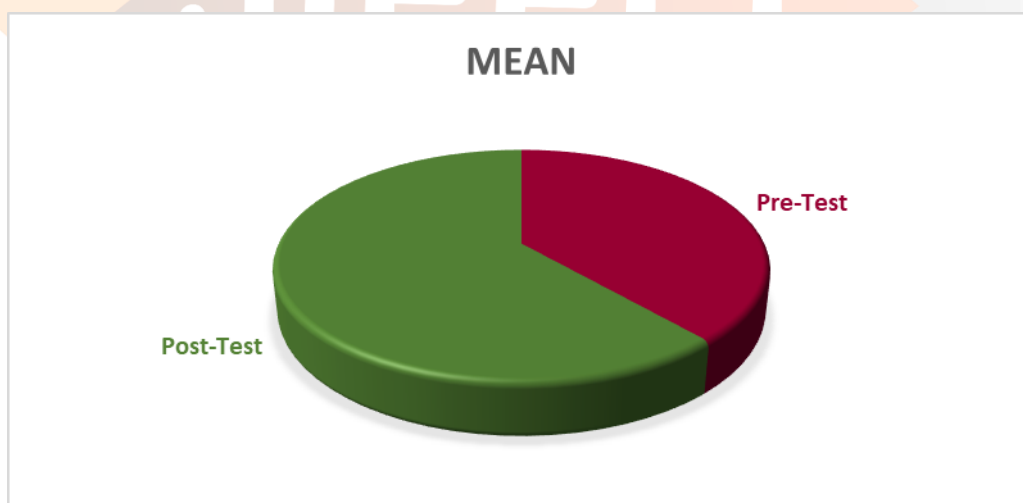


Figure 3. The Differences Between Means' Pre- and Post-Tests

According to the statistical results of the paired sample test above, there is a difference in values between pre- and post-test means. The means of the tests is 33.64 before and 53.41 after the treatment conducted. This suggests that the average post-test was a little bit more significant than the average pre-test. The subjects of the study total 22 students (N). Meanwhile, the standard deviation for the pre-test is 15.975 and post-test is 17.484. The standard error mean of the tests is 3.406 for the pre-test and 3.728 for the post-test.

Correlation of paired sample test

Table 11. The Results of Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pretest & Posttest	22	.866	.001

The results of paired sample correlations the students' pre- and pos-tests are displayed in Table 4.10. With 22 students as study subjects (N), the significant is 0.001, less than 0.05. its indicates that showed significant improve after the treatment given and the correlations score is 0.866, which is the correlation showed significantly positive correlated between pre- and post-tests.

Paired Sample Test

Table 5. The Results of Paired Samples Test

Paired Samples Test									
Paired Differences									
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
Pair 1	Pretest - Posttest	-19.77	8.794	1.875	-23.672	-15.874	-10.547	21	.001

The statistical computation using SPSS 27.0 in the table above shows that the scores have a significant value (sig. 2-tailed) of 0.001, which is less than 0.005 ($0.001 < 0.005$). It can be concluded that the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_a) is accepted. This indicates that teaching Wordvice artificial intelligence can help students improve their understanding on subject-verb agreement.

DISCUSSION

The findings are accompanied with explanations that further underscore the study's relevance. The students in the experimental class predominantly exhibited a failing categorization of comprehension for subject-verb agreement, as indicated by the pre-test results administered prior to the therapy. Statistical data indicates that the majority of pupils continue to have difficulty achieving subject-verb agreement and adhering to tense rules. The presence of Wordvice artificial intelligence aids pupils in comprehending subject-verb agreement, since it automatically detects problems and offers fast feedback. The mean of 33.64 exceeds the standard deviation of 15.975, indicating that the pre-test results of all students are satisfactory.

The statistical study revealed that pupils' categorization scores remain very low. All pupils who exhibited this behavior scored below 70; just one kid was categorized as adequate, while twenty were deemed failing, and none fell into the good or exceptional categories. All data obtained from the student pre-test exhibit a normal distribution, as the experimental class's pre-test result is 0.061, indicating a significant value over 0.05, hence supporting the acceptance of the null hypothesis (H_0) according to the Shapiro-Wilk test. The Shapiro-Wilk test, established by Shapiro and Wilk in 1965, is a statistical procedure that evaluates the normality of a dataset. It is extensively utilized across disciplines such as economics, finance, and social sciences owing to its significant efficacy in identifying normalcy in small sample sizes. The researcher employed the Wordvice artificial intelligence tool through a browser in three meetings to assess its influence on students'

learning results. In the initial meeting, the researcher administered a pre-test to assess the students' comprehension of subject-verb agreement and provided a concise explanation of the broad concept of artificial intelligence. During the second meeting, the researcher instructed the students on subject-verb agreement utilizing the English grammar book and video provided by Wordvice Service Editing. They learned how to create an account, utilize the Wordvice artificial intelligence, and compose sentences to identify subject-verb agreement errors within the Wordvice editor, thereby understanding the mistakes through the accompanying descriptions. During the last meeting, the researcher provided them with strategies for promptly rectifying the agreement mistake based on the input from Wordvice AI.

Currently, Wordvice AI supports 12 languages, including English, Spanish, Korean, Japanese, German, Simplified Chinese, Traditional Chinese, French, Russian, Portuguese, Italian, and Arabic. It offers four writing modes: light (which eliminates all spelling, grammar, and punctuation errors), standard (which enhances vocabulary and rectifies all spelling, grammar, and punctuation errors), intensive (which improves flow, enriches vocabulary, and corrects all spelling, grammar, and punctuation errors), and concise (which abbreviates text, enhances clarity, and removes all spelling, grammar, and punctuation errors). The researcher utilized a complimentary basic plan function exclusively in standard mode. The use of Wordvice AI in instructing subject-verb agreement as an adjunct for educators includes modifying the verb according to the single or plural nature of the subject, adhering to the tense norms provided by the AI feedback, with the objective of eliminating all grammatical mistakes

A post-test was subsequently employed to illustrate how instruction with Wordvice artificial intelligence might enhance students' learning outcomes. The post-test outcomes are presented in Table 4.7. There are 22 students, with a total score of 1175, resulting in a mean score of 53.41. This categorized the kids as follows: five classified as insufficient, three as acceptable, two as good, and twelve remaining in the failing group. The standard deviation of 17.484, which is smaller than the mean of 53.41, indicates that the score is below average and somewhat distinct from the mean value. Despite the overall

score falling under the failing category, the post-test means demonstrated an enhancement relative to the pre-test score means

The test results were determined after verifying the integrity of the pre- and post-test data. The data of the paired samples in Table 4.9 indicate that following treatment, students' scores have enhanced, with an average post-test score of 53.41 surpassing the pre-test score of 33.64. The hypothesis of an interwoven link between the two tests is validated, as evidenced by the significant paired sample value in table 4.11, which is 0.001

< 0.005, suggesting a significant difference. Utilizing Wordvice artificial intelligence is an efficacious strategy.

This study illustrates that employing artificial intelligence as a grammatical assistance influenced students' learning results, whereas Wordvice AI has restricted functionalities, since it did not engage like an instructor but rather served as a supplementary tool for the instructor. The findings of Limna et al. (2022) substantiate that employing artificial intelligence as an assistant can provide benefits to both students and teachers in the learning and teaching of grammar. The output generated by artificial intelligence for pupils may be inadequate or even perplexing, equally affecting both students and teachers.

Namartherdala et al. (2022) assert that artificial intelligence is prevalent throughout all educational domains, including teaching, grammar instruction, and administrative functions, and is routinely utilized in these contexts. Limna et al. (2022)

performed a comprehensive evaluation of several research to investigate the influence of artificial intelligence on grammatical concerns, such as tense and subject-verb agreement. Consequently, instructors must possess expertise in artificial intelligence. The results of this study, which compared students' pre-test scores with post-test scores following a series of treatments, demonstrated a significant improvement despite the classification in the failing category according to Brown and Abeywickrama's scoring system.

CONCLUSION

This research was conducted at UIN Ar-Raniry Banda Aceh. Simple random selection was utilized to choose one class as the sample for the inquiry. Twenty-two pupils from the intermediate grammar class were chosen as a sample. Based on the data and discussion in Chapter IV, it is determined that Wordvice artificial intelligence can affect students' learning outcomes. The matched sample test findings from the statistical analysis conducted with SPSS Version 27.0 substantiate this claim. The students' comprehension of subject-verb agreement was evaluated by contrasting their pretest and posttest results, as well as the mean scores and standard deviations. The pre-test mean score for the students was 33.64, with a standard deviation of 15.975; the post-test mean score was 53.41, with a standard deviation of 17.484.

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