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SEMANTRIS GOOGLE AI-BASED LEARNING TO ENHANCE STUDENTS' VOCABULARY MASTERY

Pembelajaran Berbasis AI Google Semantris untuk Meningkatkan Penguasaan Kosakata Siswa

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ABSTRACT

Semantris Google AI-Based Learning research has examined the students' disinterest and low level of vocabulary acquisition in English subject at MTs DDI Takkalasi. The students cited difficulty in pronunciation and other reasons for their lack of enthusiasm towards English as a difficult subject. This lack of interest and motivation is due to the absence of an interesting and enjoyable learning environment, which hinders students' ability to concentrate on their studies. In addition, the limited application of modern technology in the learning process makes this a problem that must be addressed given the increasingly advanced era. The research employed a quasi-experimental design to investigate the effectiveness of an intervention in improving students' English language proficiency. The study utilized a quantitative approach, conducting pre-test and post-test analyses to measure the impact of the intervention. The pre-test served as a baseline measurement, while the post-test assessed the outcomes after implementing the intervention. The researcher employed a quota sampling technique to select participants. The results of the Semantris Google AI-Based Learning study showed a significant difference in vocabulary improvement between the two groups, as evidenced by the T-count value of 6.858, exceeding the critical T-table value of 2.060. The rejection of the null hypothesis (H0) is supported by the mean N gain value of 0.4249 obtained from the experimental class, which falls within the moderate range according to the N gain table. This finding confirms that the use of Semantris Google AI-Based Learning is very effective in improving the vocabulary mastery of MTs DDI Takkalasi students.

Keywords: Aritificial Intelligence, Semantris Google AI, Vocabulary Enhancement

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ABSTRAK

Hasil penelitian yang dilakukan di MTs DDI Takkalasi mengenai kurangnya minat dan rendahnya pemerolehan kosakata dalam mata pelajaran Bahasa Inggris. Penelitian ini menyoroti kesulitan dalam pengucapan serta faktor lain yang menjadi alasan keengganan siswa terhadap Bahasa Inggris sebagai mata pelajaran yang sulit. Kurangnya minat dan motivasi siswa disebabkan oleh kurangnya lingkungan belajar yang menarik dan menyenangkan, sehingga menghambat konsentrasi belajar mereka. Selain itu, minimnya penerapan teknologi modern dalam proses pembelajaran juga menjadi masalah yang perlu diatasi mengingat perkembangan zaman yang semakin maju. Penelitian ini menggunakan desain quasi-eksperimental untuk menginvestigasi efektivitas intervensi dalam meningkatkan kemampuan Bahasa Inggris siswa. Pendekatan kuantitatif digunakan dengan melakukan analisis pre-test dan post-test untuk mengukur dampak intervensi tersebut. Pre-test digunakan sebagai pengukuran baseline, sedangkan post-test mengevaluasi hasil setelah intervensi diterapkan. Peneliti menggunakan teknik quota sampling untuk memilih partisipan. Hasil studi penggunaan Semantris Google AI-Based Learning menunjukkan perbedaan signifikan dalam peningkatan kosakata antara kedua kelompok, dengan nilai T-count sebesar 6.858, melebihi nilai T-table kritis sebesar 2.060. Penolakan terhadap hipotesis nol (H0) didukung oleh nilai mean N gain sebesar 0.4249 yang diperoleh dari kelas eksperimen, yang termasuk dalam rentang moderat menurut tabel N gain. Temuan ini mengkonfirmasi bahwa penggunaan Semantris Google AI-Based Learning sangat efektif dalam meningkatkan penguasaan kosakata siswa MTs DDI Takkalasi.

***Kata Kunci**: Kecerdasan Buatan, Semantris Google AI, Peningkatan Kosakata*

A. BACKGROUND

Mastery of vocabulary is one of the keys to understanding and speaking English fluently. Like stacks of Lego, each word is an integral part of the larger sentence structure, and understanding the meaning of each word is the first step to understanding the meaning of the sentence as a whole. Although many people think that being fluent in English is just a matter of grammar and proper intonation (Sardi et al, 2017), the fact is that mastery of a broad vocabulary is also an important factor in good English proficiency.

According to the results of the 2022 Education First (EF) survey, the level of English proficiency in Indonesia is low compared to other countries in the Southeast Asian region. Based on the survey, Indonesia was only able to collect EPI of 453 points and is ranked fifth in Southeast Asia or 74 in the world. The ranking puts Indonesia in the low category. Indonesia's ranking is below the regional average, indicating that there are still a large number of individuals in Indonesia who have limited English skills (Humaera et al, 2023). This may be due to several factors, such as the lack of opportunities to learn and use English on a regular basis, as well as the lack of facilities available to help individuals strengthen their English skills. In addition, problems such as lack of motivation and interest in learning English can also cause the level of English proficiency in Indonesia to be classified as low (KataData, 2020). From the preservation conducted at MTs DDI Takkalasi, many students claimed to be less interested in English subjects. Starting from the very

difficult pronunciation, to several other reasons given by some students who feel English is a difficult subject. Judging from the phenomenon of students' discomfort with English subjects, this is caused by the lack of interest and motivation of students in learning. The lack of an interesting and fun learning atmosphere makes it difficult for students to focus on learning.

This is also due to the lack of utilization of modern technology in the learning process. The use of modern technology is still minimal in the learning process because there are still many teachers who still continue to use conventional methods in the learning process. The conventional method that is often used is a method that focuses on the teaching process directed by the teacher, such as lectures and questions and answers. Although this method has been proven effective in the learning process in the past, nowadays there are many modern technologies that can help the learning process to be more interactive and fun for students.

The things that might also cause teachers to continue to use conventional learning models in schools because the school environment is very supportive for implementing these methods where MTs DDI Takkalasi is a boarding school that is no stranger to da'wah activities and lectures. Besides that, because of factors such as administration and school management, teachers are too busy to spend time preparing more innovative learning. In addition, teachers may also feel that they do not have enough time to find and explore newer learning methods or to take the necessary training to use them. Technological media such as educational applications and websites can assist teachers in providing more varied and interesting learning materials for students, so that they can help students understand learning material more easily and quickly (Mujahidah et al, 2020). The minimal contribution of modern technology in this era causes the learning process to be too focused on the existing teaching process, so that some students will feel less involved and unenthusiastic in the learning process.

Nonetheless, there are steps that can be taken to improve English skills in school, such as increasing opportunities to learn and use English regularly, as well as providing better facilities to help individuals strengthen their English skills. In addition, increasing motivation and interest in learning English by using attractive technological media is also important to increase the level of English proficiency in Indonesia. Students who have a wide vocabulary will more easily understand the text they read, more easily remember the information they listen to, and are freer to express themselves fluently in English. On the other hand, students who lack a broad vocabulary will feel burdened in learning English. They may have difficulty understanding the text they read, remembering information they hear, or expressing

themselves fluently in English (Kuncoro, 2017). English exercises supported by multimedia can hold students' attention while increasing their understanding of vocabulary and phrases (Sasan & Rabillas, 2022).

In this 5.0 era, Teaching language with the help of computers and the internet has attracted the attention of many practitioners and researchers, so the number of studies investigating whether computers and the internet promote language learning is growing. There are lots of digital media that can be used as interesting and very effective learning media such as online games in English (Sardi et al, 2023). So far, the role of games in language learning is still considered as mere entertainment. Playing games with spoken and written English can provide a better understanding of language structure and vocabulary builder, and help improve writing and speaking skills in the language. This shows that there is a significant relationship between playing games with spoken and written English and vocabulary scores (Jensen, 2017). This is not surprising since gamers are often motivated to understand the input provided in the game, so paying attention to the language used in the game will help them advance in the game. The media that can change the learning experience into an interesting and effective learning process is by using educative digital games-based Artificial Intelligence (AI) (Adams et al., 2022).

B. RESEARCH METHODOLOGY

The researcher employed a quasi-experimental research design in this study, replicating methods and procedures that simulated an experimental setup while lacking complete control over participant conditions and experiences. Utilizing a quantitative approach, the researcher conducted a pre-test and post-test analysis to evaluate the effects of the intervention. The pre-test provided baseline measurements, and the post-test assessed the outcome after the implementation of the intervention. By adopting this quasi-experimental design, the researcher aimed to investigate the impact of the intervention on the desired outcome variables. The research that has been carried out using the quasi-experiment design method is in the following table:

Table 1.1 Quasi Experiment Design

Class	Pre-test	Treatment	Post-test
Experiment Class	$O1^1$	X	$O2^1$
Control Class	$O1^2$	Konvensional	$O2^2$

The research was conducted at MTs DDI Takkalasi, which is located at JL. HM. Tahir Dani, No. 21, Balusu, Barru. The research spanned six meetings or approximately one month, including data analysis. The population of this research was eighth-grade students at MTs DDI Takkalasi, with the total number of students as shown in the table below:

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Table 2.2 Population of Research

Kelas VIII B (Putri) Tahun Ajaran 2022/2023	
Jumlah Siswa	Jumlah Romber
72	3

The sample is a group of individuals who are selected deliberately from a population to be representative of the entire population. By using a sample, we can get a more accurate and reliable picture of the characteristics and behavior of the population. The sample chosen for a class experiment was VIII B 1 Class with 26 students, and for the control class, it was VIII B 2, which also totaled 26 students. The samples were taken using the quota sampling technique.To collect the data the researcher conducted the procedures below:

1. Pre-Test

   The pre-test was carried out before teaching activities began. Before the researcher gave the treatment at the first meeting, the researcher gave a pre-test to students to identify the students' vocabulary mastery.

2. Treatment

   Based on the research method, there were two classes that were examined, but only one got treatment, namely the experiment class. The researcher gave the treatment to students in the experiment class and gave some materials about vocabulary. This treatment was conducted for six meetings.

The procedure of the treatment was as follows:

a) The class was opened according to the syllabus used during the research.
b) The students were introduced to the Semantris AI-based learning platform, which utilized Google AI technology to enhance vocabulary acquisition. In the research process, students played arcade mode in Semantris Google AI. Arcade mode provided vocabulary where students had to find vocabulary that was related to the word provided by Semantris Google AI. If the word was more sustainable, the more score was obtained in the game.
c) The students' progress was monitored, and feedback was provided on their performance.
d) Games, quizzes, and other interactive activities that used the Semantris platform were incorporated to make learning vocabulary fun and engaging.
e) The students' vocabulary mastery was continuously evaluated, and adjustments were made to the treatment as needed.
f) After several weeks of treatment, a post-test was given to measure the students' vocabulary mastery and evaluate the effectiveness of the Semantris-based learning approach.

While the class that did not receive treatment was called the control class, where the material that was researched in

this class was provided using the usual material and learning methods or using conventional methods. The procedure of the learning in the control class was as follows:

a) Opened the class according to the syllabus used during the research.
b) Providing the usual material and learning methods or using conventional methods in teaching vocabulary.
c) Monitor students' progress and provide feedback on their performance.
d) Continuously evaluate students' vocabulary mastery and make adjustments to the treatment as needed.
e) After several weeks of treatment, give a post-test to measure the students' vocabulary mastery.

3. Post-tests

Post-test were given when the treatment had also been conducted for several days. The post-test was given to determine whether the students had improved in English.

In the research process, the writer utilized a test as a research instrument. This choice aligned with the research question. By employing the test as a research instrument, the study effectively captured and analyzed the impact of the intervention on the students' English vocabulary. Overall, the use of tests as an instrument in this quasi-experimental research yielded valuable insights into the effectiveness of the intervention and its influence on the development of students' English vocabulary. In quantitative research, data analysis techniques directed to answer the problem formulation have been determined. Due to data was quantitative, then analyzes the data using statistical methods that have been available.

The research sample data was calculated using SPSS to determine if there was a significant difference between the scores of students' vocabulary mastery before and after the implementation of Semantris Google AI-based learning. The methodology involved describing and providing an overview of the study object through the analysis and interpretation of collected data and samples. This analysis primarily focused on calculating the mean, standard deviation, and conducting various tests prior to performing inferential analysis. The students' correct answers of pre-test and post-test were scored using the formula:

$$score = \frac{Student\ correct\ answer}{The\ total\ number\ of\ them} \times 100$$

Data analysis used descriptive statistics, which describes the existing data to obtain facts from respondents, hence more easily to understand. The analysis used with descriptive statistics was carried out by collecting, compiling, presenting, and analyzing all data from all variables in the form of frequency distribution tables, mean, mode, median, and standard deviation, and percentage graphs. The scores of the students were classified as follows:

Table 3.3 Classification of Students' vocabulary test score

No	Scores	Classification
1	80-100	Very good
2	66-79	good
3	56-65	Fair
4	40-55	Poor
5	<39	Very Poor (Arikanto, 2011)

The percentage of students' vocabulary test score was determined using the following formula:

$$P = \frac{F}{N} \times 100\%$$

Where: P : Percentage

F : Frequency

N : Total Number of students

To determine the average score, the following formula was utilized:

$$\overline{x} = \frac{\sum x}{N}$$

Where: $\overline{x}$: Mean Score

$\sum x$: The total number of the students score

N : Total number of students

The standard deviation of the students' scores in the pre-test and post-test was calculated using the following formula:

$$S = \sqrt{\frac{SS}{N\text{-}2}}, \text{ Where } SS = \sum X^2 - \frac{(\sum x)}{N}$$

Where: S : The standard Deviation

SS : The square root of the sum of square

$\sum X2$: The sum of square

$(\sum x)2$: Total square of the sum

N : Total number of students

Standard deviation is used for measuring the mean score as valid as result data, which generally represents the population average.

The formula employed to ascertain the disparity between students' scores in the pre-test and post-test was as follows:

$$t = \frac{\bar{x}1 - \bar{x}2}{\sqrt{\left(\frac{SS1 + SS2}{n1 + n2 - 2}\right)\left(\frac{1}{n1} + \frac{1}{n2}\right)}}$$

Where: t : Test of significance

$\overline{x}1$: Mean score of Pre-Test

$\bar{x}2$: Mean score of Post Test

SS_1 : Total square of the sum

SS_2 : Sum square of Post Test

n_1 : Number of students' of Pre-Test

n_2 : Number of students of Post-Test

1 : Constant number

2 : Number of classes

The t-test assumed a crucial role in comparing the data results of two findings, characterized by different sample categories and average outcomes.

C. FINDINGS DISCUSSION

The research process in the control class began with a pre-test conducted by the researcher to assess the level of English vocabulary mastery among the students. Subsequently, the researcher implemented conventional teaching methods, commonly employed by teachers in the school where the research took place, focusing on improving students' vocabulary through memorization of vocabulary lists. Four sessions were conducted based on the lesson plan provided by the teacher. Towards the end of each session, a game named "The Champion" was conducted, dividing the students into two groups. Each group was tasked with creating a list of vocabulary words to be memorized, and the game was won by the group that could write the highest number of words in the given short time, as determined by the teacher. Following the completion of the four sessions, a post-test was administered to assess the students' vocabulary mastery level after the treatment.

As for the experimental class, similar to the control class, a pre-test was administered in the first session. In subsequent sessions, the researcher utilized Semantris Google AI as the core learning tool to enhance the students' vocabulary. Four sessions were conducted, and at the end of each session, a game called "The Champion of Semantris Google AI" was organized. In this game, students aimed to achieve the highest score to become the winner. Finally, a post-test was administered during the last session to assess the students' vocabulary mastery level following the implementation of the Semantris Google AI intervention.

Table 1.4 Descriptive Statistic

Descriptive Statistics

Test/ Respondent	N	Minimum	Maximum	Mean	Std. Deviation
ExPretest	26	47.00	67.00	571.923	665.744
ExPostest	26	60.00	93.00	755.769	776.234
ConPretest	26	50.00	65.00	553.846	527.695
ConPostest	26	31.00	73.00	566.923	1.904.682
Valid N	26				

The table above presents the results of two different classes: the control class, which utilized conventional methods to improve students' vocabulary, and the experimental class, which utilized Semantris Google AI-Based Learning. The table provides several statistical measures for each class. For the experimental class, the "ExPretest" column indicates that there were 26 students who participated in the pretest. The minimum score obtained was 47.00, while the maximum score was 67.00. On average, the students achieved a mean score of 57.1923, with a standard deviation of 6.65744. Moving to the "ExPosttest" column, it represents the post-test results for the experimental class. Similarly, there were 26 students involved. The minimum score recorded was 60.00, while the maximum

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score reached 93.00. The mean score for this post-test was 75.5769, with a slightly higher standard deviation of 7.76234. Now, focusing on the control class, the "ConPretest" column shows that there were 26 students who took the pretest. The minimum and maximum scores were 50.00 and 65.00, respectively. The average score obtained by the students was 55.3846, with a standard deviation of 5.27695. Lastly, the "ConPosttest" column represents the post-test results for the control class. The data includes 26 students. The minimum score achieved was 31.00, and the maximum score was 73.00. On average, the students scored 56.6923, with a relatively high standard deviation of 19.04682. The "Valid N (listwise)" row indicates that there were a total of 26 students with complete data across all the variables measured in the study.

In order to assess the significant difference between the utilization of Semantris Google AI-Based Learning and the conventional method for teaching vocabulary at MTs DDI Takkalasi, the researcher conducted an Independent Samples T-test. However, prior to conducting the test, certain requirements needed to be fulfilled, including the assessment of normality test and homogeneity test. The results of the normality test and homogeneity test are presented as follows:

Table 4.3 Tests of Normality

	Group of score	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	Df	Sig.	Statistic	df	Sig.
Student vocabulary score	Exp. Class pre test	.231	26	.001	.840	26	.065
	Exp. class post test	.178	26	.034	.929	26	.075
	Contr. class pre test	.231	26	.001	.840	26	.051
	Contr. Class post test	.385	26	.000	.500	26	.071

According to the table above, the significance value of each data in the Shapiro Wilk column is 0.065 for the experimental class pre-test, then 0.075 for the experimental class post-test, then 0.051 for the control class pre-test and 0.071 for the control class post-test, all of these data when compared to 0.05 are greater than the significance value of 0.05, so it is confirmed that all data are normally distributed.

Table 5.5 Test of Homogenity

		Levene Statistic	df1	df2	Sig.
Student vocabulary score	Based on Mean	1.831	3	100	.146
	Based on Median	1.241	3	100	.299
	Based on Median and with adjusted df	1.241	3	33.471	.310
	Based on trimmed mean	1.335	3	100	.267

According to the provided output, the significance value obtained from the test of homogeneity based on the mean is 0.146. The

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obtained significance value of 0.146 is greater than of 0.05.

Table 6.6 Independetn sample T-test

		Levene's Test for Equality of Vari-ances		t-test for Equality of Means					
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Diffe-rence	Std. Error Diffe-rence	95% Confidence Interval of the Difference
									Lower Upper
N gain Score	Equal variances assumed	.406	.527	6.858	50	.000	.34798	.05074	.24607 .44990
	Equal variances ıot assume			6.858	49.730	.000	.34798	.05074	.24606 .44991

Based on the information provided in the table, the calculated T-value is 6.858, while the critical T-value from the table is 2.060. The comparison of 6.858 being greater than 2.060 indicates that the null hypothesis (H0), which suggests no significant difference between classes using Google AI-Based Learning Semantris and those not using it to improve student vocabulary, can be rejected. This implies that there is evidence to support the alternative hypothesis (H1), which states that there is a significant difference between the two classes in terms of improving students' vocabulary.

In order to evaluate the efficacy of using Google AI-Based Learning Semantris to enhance students' vocabulary, the researcher conducted an experiment using the N gain Test. The experimental group consisted of students who used Semantris Google AI-Based Learning, while the control group employed conventional teaching methods for vocabulary instruction. The data obtained from both groups was entered into SPSS for analysis. The resulting findings are presented below:

Table 7.7 Control & Experiment Class N-giant Result

N gain Score	Class		Stat-istic	Std. Error
Exp-eriment	Mean		.4249	.03453
	95% Confidence Interval for Mean	Lower Bound	.3538	
		Upper Bound	.4960	
	5% Trimmed Mean		.4253	
	Median		.4255	
	Variance		.031	
	Std. Deviation		.17607	
	Minimum		.00	
Control	Mean		.0769	.03718
	95% Confidence Interval for Mean	Lower Bound	.0003	
		Upper Bound	.1535	
	5% Trimmed Mean		.0825	
	Median		.1111	
	Variance		.036	
	Std. Deviation		.18956	
	Minimum		-.38	

The Mean N gain score in the Experiment class is 0.4249 if it is categorized in the N gain table that said that if the N gain socre $0,3 < g < 0,7$, then the value is medium category or moderate.

D. DISCUSSION

The use of educative digital games based on Artificial Intelligence (AI) has the potential to transform the learning experience into an engaging and effective process, according to Catherine the media that can change the learning experience into an interesting and effective learning process is by using educative digital games-based Artificial Intelligence (AI) (Adams et al., 2022). One example of such technology is Semantris Google AI-Based Learning, which utilizes AI algorithms to enhance vocabulary learning. In connection to this research the researcher has been using Semantris Google AI-Based Learning di DDI Takkalasi to enhance students' vocabulary mastery and have done in six meetings. The result show that the mean N gain score in the Experiment class is 0.4249, as categorized in the N gain table. This value falls within the moderate range, indicating a reasonably effective outcome. Therefore, it can be inferred that the utilization of Semantris Google AI-Based Learning is quite effective in improving students' vocabulary mastery.

By incorporating educative digital games with AI technology, students can experience a more interactive and immersive learning environment. These games often provide real-time feedback, adaptive learning paths, and personalized experiences tailored to individual students' needs. The use of AI algorithms enables the games to analyze students' performance, identify their strengths and weaknesses, and provide targeted interventions accordingly. This personalized approach can help students engage with the material more effectively and make their learning experience more enjoyable.

Moreover, the effectiveness of using Semantris Google AI-Based Learning in enhancing vocabulary mastery is evident from the moderate N gain score of 0.4249. This indicates that students in the experimental class experienced notable improvement in their vocabulary knowledge and retention. The AI algorithms employed in Semantris Google AI-Based Learning likely contributed to this success by providing tailored word associations, contextual learning, and interactive challenges. These features help students expand their vocabulary, improve word recognition, and enhance their overall language proficiency.

In conclusion, the integration of educative digital games based on AI, such as Semantris Google AI-Based Learning, offers a promising approach to make the learning process more interesting and effective. The moderate N gain score of 0.4249 in the Experiment class suggests that the use of Semantris Google AI-Based Learning has proven to be quite effective in boosting students' vocabulary mastery. The combination of AI technology and gamified learning experiences has the potential to revolutionize education by creating engaging and personalized learning

environments that cater to the unique needs of each student.

Furthermore, researcher also compared the learning method using Semantris Google AI-Based Learning with the usual method used by teachers at school in order to improve students' vocabulary and obtained the results that there was a significant difference in students' vocabulary scores in the experimental class, namely the class that used Semantris Google AI-Based Learning and the one that used the Conventional Method. AI assists the teachers to make students more interested in the learning that is done, this is in accordance with the research conducted by İbrahim Yaşar Kazu and Murat Kuvvetli with the title "The Influence of Pronunciation Education via Artificial Intelligence Technology on Vocabulary Acquisition in Learning English" in 2023. Based on the results of this study, the artificial intelligence-supported speech recognition and pronunciation technique was slightly more effective than the phonetic alphabet (Kazu & Kuvvetli, 2023).

Moreover, Semantris Google AI-Based Learning also provides exercises sfor students to improve their vocabulary, which is in line with the research conducted by Jingtai Li and Rong Wen, with the title "Research on AI-assisted Teaching Mode for English Teaching from the Perspective of Total Physical Response (TPR) in 2022 (Li & He, 2022). Based on the results of this study, some technologies such as AI in learning English are commonly provide effective exercises for English learners, which has objective feedback on English teaching and learning.

Additionally, the utilization of Semantris Google AI is not only highly effective in enhancing fundamental vocabulary but also in improving writing skills, reading comprehension, and fine motor skills. This assertion finds support in a research study titled "The Use of AI (Artificial Intelligence) in English Learning Among University Students" conducted by Hemas Kumala Dewi in 2021 (Dewi et al., 2021.). The research provides empirical evidence of the positive impact of AI-based learning tools like Semantris Google AI on various language-related abilities beyond vocabulary acquisition.

E. CONCLUSION AND SUGGESTION

Based on the scientific research and the provided data, it can be concluded that there is a significant difference between the class that utilizes Semantris Google AI-Based Learning-based learning and the class that uses conventional methods in improving students' vocabulary. This conclusion is supported by the T-count value of 6.858, which exceeds the critical T-table value of 2.060. The comparison of 6.858 > 2.060 leads to the rejection of the null hypothesis (H0), which states that there is no significant difference between the two classes. Therefore, the alternative hypothesis (H1) is accepted, indicating that there is indeed a significant difference between the classes that utilize Google AI-Based Learning Semantris

and those that do not in terms of improving students' vocabulary.

Based on the scientific research data provided, it can be concluded that the use of Semantris Google AI-Based Learning is quite effective in improving students' vocabulary. This conclusion is supported by the Mean N gain score of 0.4249 obtained from the Experiment class, which falls within the moderate range as categorized in the N gain table. The moderate N gain score indicates a notable improvement in students' vocabulary mastery as a result of using Semantris Google AI-Based Learning. This suggests that the AI-powered platform has successfully enhanced students' vocabulary acquisition and retention. The interactive nature of the platform, combined with the AI algorithms, likely played a significant role in engaging students and facilitating effective vocabulary learning.

Therefore, based on the research findings, it can be confidently stated that the utilization of Semantris Google AI-Based Learning is quite effective in increasing students' vocabulary. This highlights the potential of incorporating AI technology into educational settings to enhance language learning outcomes.

For students, it is highly recommended for them to utilize Semantris Google AI as part of their vocabulary learning process, considering its educational aspects, despite its basic nature as a game. This research focuses on harnessing the potential of Semantris Google AI for the development of students' English vocabulary, while striking a balance between the educational value derived from its implementation and the entertainment aspect of the game. For educators it is hoped that they will always be able to adapt and take advantage of technological developments. Moreover, teachers will still provide direct guidance and direction because in the teaching and learning process a teacher is still needed. With technology it does not replace the role of the teacher in class, Semantris Google AI only as a tool to assist teachers in the learning process.

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