

## UTILIZING COGNI ANKI FLASH CARD : AI-BASED APPLICATION TO IMPROVE STUDENTS' VOCABULARY MASTERY

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### ABSTRAK

Kesuksesan pendidikan sangat dipengaruhi oleh berbagai aspek penting yang saling terkait, seperti siswa, kurikulum, metode pembelajaran, tujuan pembelajaran, dan sistem penilaian. Penelitian ini bertujuan untuk mengetahui pengaruh penggunaan media Cogni Anki Flash Card terhadap peningkatan penguasaan kosakata siswa kelas sebelas. Cogni Anki Flash Card adalah alat atau aplikasi pembelajaran yang menggunakan metode pengulangan berjarak (spaced repetition) untuk membantu pengguna mengingat kosakata, menggunakannya secara tata bahasa, dan informasi kosakata secara lebih efektif. Penelitian ini menggunakan desain penelitian kuantitatif yang menggunakan kelas eksperimen dan kontrol. Populasi penelitian ini adalah siswa kelas sebelas di SMK Negeri 1 Siantar pada tahun ajaran 2025/2026. Peneliti mengambil dua kelas sebagai sampel dalam penelitian ini. Sampelnya adalah kelas XI DKV 1 sebagai kelas kontrol yang terdiri dari 36 siswa di mana kelas ini hanya diajarkan menggunakan metode konvensional. Sedangkan kelas XI DKV 2 yang terdiri dari 36 siswa merupakan kelas eksperimen yang diajarkan dan menerima perlakuan dari Cogni Anki Flash Card. Data diperoleh melalui pre-test dan post-test yang diberikan kepada siswa di kedua kelas. Data dianalisis menggunakan statistik deskriptif, persentase peningkatan skor, uji normalitas dan homogenitas, uji t berpasangan dan independen, serta analisis ukuran efek. Temuan menunjukkan peningkatan signifikan pada kelas eksperimen, dengan skor rata-rata meningkat dari 46,39 pada pra-uji menjadi 83,06 pada pasca-uji. Berdasarkan klasifikasi pasca-uji, 5,6% siswa mencapai kategori "sangat baik", 44,5% berada di kategori "baik sekali", dan 50,0% berada di kategori "baik". Sebaliknya, kelas kontrol hanya menunjukkan kemajuan yang moderat, dengan skor rata-rata meningkat dari 48,61 menjadi 66,53. Distribusi hasil pasca-uji menunjukkan bahwa 11,1% siswa mencapai kategori "sangat baik", 13,9% berada di kategori "cukup baik", 27,8% berada di kategori "cukup baik", dan 8,3% berada di kategori "kurang baik". Analisis statistik melalui uji t berpasangan dan independen mengkonfirmasi perbedaan signifikan antara kedua kelas. Uji t untuk perhitungan ukuran efek (Cohen's  $d = 0,74$ ) menunjukkan efek sedang pada penguasaan kosakata siswa. Lebih lanjut, uji t menunjukkan nilai  $p$  (2-tailed) sebesar 0,000, yang berada di bawah 0,05. Akibatnya, hipotesis nol ( $H_0$ ) ditolak, dan hipotesis alternatif ( $H_1$ ) diterima karena nilai  $p$  ( $0,000 < 0,05$ ). Temuan ini menunjukkan bahwa Anki Flash Cards dapat menjadi alat yang efektif untuk meningkatkan penguasaan kosakata siswa di SMK Negeri 1 Siantar.

### ABSTRACT

### Keywords:

Cogni Anki Flash Card, AI-Based Teaching Media, Vocabulary Mastery

*The success of education is greatly influenced by various important aspects that are interrelated, such as students, curriculum, learning methods, learning objectives, and evaluation systems. This study aims to determine the effect of using Cogni Anki Flash Card media on improving vocabulary mastery of eleventh grade students. Cogni Anki Flash Card is a learning*

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*tool or application that uses a spaced repetition method to help users remember vocabulary, use it grammatically and vocabulary information more effectively. This study uses a quantitative research design that uses experimental and control classes. The population of this study was eleventh grade students at SMK Negeri 1 Siantar in the 2025/2026 academic year. The researcher took two classes as samples in this study. The sample was XI DKV 1 as a control class consisting of 36 students where this class was only taught using conventional methods. While class XI DKV 2 consisting of 36 was an experimental class that was taught and received treatment from Cogni Anki Flash Card. Data were obtained through pre-tests and post-tests given to students in both classes. Data were analyzed using descriptive statistics, percentage increase in scores, normality and homogeneity tests, paired and independent t-tests, and effect size analysis. The findings revealed significant improvement in the experimental class, with the mean score increasing from 46.39 in the pre-test to 83.06 in the post-test. Based on the post-test classification, 5.6% of students achieved the "excellent" category, 44.5% were in "very good," and 50.0% were in "good." In contrast, the control class showed only modest progress, with the mean score increasing from 48.61 to 66.53. The distribution of the post-test results showed that 11.1% of students achieved the "excellent" category, 13.9% were "fair," 27.8% were "fair," and 8.3% were "poor." Statistical analysis through paired and independent t-tests confirmed a significant difference between the two classes. The t-test for effect size calculation (Cohen's  $d = 0.74$ ) indicated a moderate effect on students' vocabulary mastery. Furthermore, the t-test showed a p-value (2-tailed) of 0.000, which is below 0.05. Consequently, the null hypothesis ( $H_0$ ) is rejected, and the alternative hypothesis ( $H_1$ ) is accepted since the p-value (0.000) < 0.05. These findings indicate that Anki Flash Cards can be an effective tool to improve students' vocabulary mastery at SMK Negeri 1 Siantar.*

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## 1. Introduction

The development of technology can be said to be one of the important factors that greatly influences the changes of the times. Technology is not only a symbol of the progress of civilization, but also an important instrument in various sectors of human life. This means that it can be said that technology was created as an answer to the needs of humans that continue to grow (Yusuf et al., 2025). These needs include various aspects of life such as work, health, transportation, communication, and of course education. Technology is a bridge that helps humans live their lives more easily, quickly, and efficiently. In the context of the world of work and health, technology is widely used to speed up processes, save energy, and minimize errors. In the field of education, the presence of technology provides a new color in the learning process, both in terms of delivering materials, evaluation, and developing more innovative learning methods (Tjahyanti et al., 2022).

Technology plays a major role as a supporter and facilitator in the teaching and learning process. Educational technology is present not just as a tool, but as an integrated

system in the education process. As explained by Hutasuhut & Harahap (2024) "Integration of educational technology encourages innovative teaching strategies and can improve the overall learning experience". This means that technology is not only used to deliver material, but is also systematically designed to achieve optimal learning goals. One example of the application of technology is in the form of a language translation tool, which greatly helps students understand foreign languages more practically and efficiently. Education itself is the main pillar in shaping individual potential, both in terms of knowledge, skills, and character. With a good education, a person is able to think critically, creatively, and has competitiveness and a broad view of the future (Tahir, 2012).

The success of education is greatly influenced by various important aspects that are interrelated, such as students, curriculum, learning methods, learning objectives, and evaluation systems. Among these aspects, the curriculum has a central position because it is the basic guideline in implementing teaching and learning activities. The curriculum is the main foundation in designing and implementing all teaching and learning activities. The curriculum not only contains what material must be taught, but also determines learning strategies, evaluation methods, and competencies that students must achieve. The curriculum functions as an educational roadmap that directs all educational actors in achieving the final learning goals. Therefore, the curriculum must be updated along with educational needs. As emphasized by Ramadani et al. (Syamsiar, 2023) it is very important for the curriculum to be updated regularly to reflect changes in educational goals and needs that continue to develop.

Currently, the education system in Indonesia has begun to implement a hybrid curriculum approach as a new strategy in the learning process. This approach was born from the need to accommodate the very rapid progress of information and communication technology. Kusumajati et al. stated that "hybrid learning is an approach that combines online and traditional learning methods to increase student engagement and improve educational outcomes. By combining face-to-face and online learning, this approach provides greater flexibility for students to learn anytime and anywhere, without the constraints of space and time. In addition, the hybrid curriculum also aims to equip students and teachers with the digital skills needed in the modern era (Kucan, 2012).

The implementation of a hybrid curriculum not only provides benefits for students, but also has a positive impact on deep learning on students, This implementation opens up space for the application of deeper deep learning by referring to the teaching and learning process that can encourage students to understand concepts and materials more deeply, linking previous knowledge and experiences and applying them in real life. so that learning does not only focus on delivering material, but also encourages active student participation, developing deep learning, and improving problem-solving skills through the use of technology. Therefore, students are required to be able to utilize technology optimally, so that students not only gain knowledge, but also develop their digital literacy (Kusumajati et al., 2023).

One of the learning activities impacted by the implementation of the hybrid curriculum at the Vocational High School (SMK) level is that learning can be conducted online using media such as online platforms to deliver materials or assignments. One subject that could be impacted by this hybrid curriculum is English. English is one of the compulsory subjects that must be mastered by students. This is important because English functions as an international language and is an important provision in the world of work. Language skills consist of four basic skills, namely listening, speaking, reading, and writing. These four skills cannot be separated and must be taught in an integrated manner so that students can communicate well in various situations. As stated by Nan (2018), these skills are interdependent, meaning that proficiency in one skill can improve other skills, resulting in a more effective language learning experience. The material taught at the vocational high school level includes the basics of language skills and language structures such as tenses and vocabulary mastery. Ideally, English learning in vocational high schools can be adjusted to each major, for example, multimedia majors can be given vocabulary material about technology and design (Hutasuhut & Harahap, 2024).

In this research, the researcher focused on English language learning, namely vocabulary mastery at the vocational school level using technology media. Based on the researcher experience when carrying out teaching internship at SMK Negeri 1 Siantar in the 2024 academic year, the researcher found student problems in vocabulary mastery which can be seen from the results of students' daily scores. Where the value is expected to achieve the minimum completion criteria in learning, namely 75. However, in reality, this value has not been achieved properly by students, where students are only able to achieve a score of 60. This problem is caused by the lack of interactive learning media used by teachers in the learning process in the classroom. Teachers tend to use conventional and less interesting media such as textbooks, vocabulary memorization exercises and summaries. Where this media is less effective for students to be able to master vocabulary so that students cannot master vocabulary even for basic vocabulary.

Seeing these problems, The researcher innovates in the use of more effective and interactive learning media. Sugiyono (Dauletova & Rakhimova, 2022) stated that "educational innovation must be evaluated to solve learning problems by introducing new media or methods that are more effective and efficient." This innovation can be realized through technology, one of which is the use of appropriate technology. One form of innovation is by utilizing artificial intelligence (AI) into the world of education as a learning medium. AI is a simulation of human intelligence on machines that are programmed to think, learn, and make decisions like human intelligence Tjahyanti et al. (2022) .In the context of learning media, AI can provide a personalized learning experience, adapt to student needs, and optimize student learning outcomes. This form of media can be in the form of images, audio, video, or digital applications specifically designed to support the student learning process.

In this research, the researcher used new media in teaching vocabulary in the form of AI generated based application which is used to improve the vocabulary mastery process. The application is the Cogni Anki Flash Card Application. According to Nender

et.al (Crystal, 2017) This application is a picture card-based learning application that uses a scheduled repetition method to help users memorize vocabulary, use it grammatically and vocabulary information more effectively. The advantages of this media compared to previous conventional media lie in its benefits in helping students master vocabulary such as knowing the meaning of a word and using the words in sentences based on their function

Therefore, by using the Cogni Anki Flash Card application as a new learning medium, researchers hope to improve students' vocabulary mastery through treatment and the provision of pre-tests and post-tests conducted by researchers to students. This treatment was carried out in several meetings to see the influence and impact of using the Cogni Anki Flash Card application on improving students' vocabulary mastery at SMK Negeri 1 Siantar. The use of digital flash cards, which utilize technology and a spaced repetition system, is very effective in supporting vocabulary acquisition and retention among students (Agnes & Srinivasan, 2024). This also has a positive impact on students' vocabulary mastery scores. Thus, through this application, it can be said that students get the right learning media in mastering vocabulary based on their needs (Arsyad, 2017).

By utilizing the Cogni Anki Flash Card application as a learning media, it is hoped that this application will be able to answer the existing challenges, namely the low student's vocabulary mastery at grade eleven of SMK Negeri 1 Siantar. The use of this application is also a form of technology integration in learning that can support the achievement of learning objectives as the right learning media (SUTRA, 2024). in addition, it makes students not only academically intelligent, but also literate in using technology.

Based on the description above, the researcher is interested in conducting research with the title "Utilizing Cogni Anki Flash Card : AI based application to improve students' vocabulary mastery at Grade Eleven of SMK Negeri 1 Siantar".

## **2. Method**

Based on the problems to be investigated, this research uses a quantitative method with a quasi-experimental design. According to Creswell (2008:10) quasi-experiment is experimental situations in which the researcher assigns, but not randomly, participants to groups because the experimenter cannot artificially create groups for the experiment. In this design, the researcher will use two groups to be studied, namely the experimental class and the control class. where in the experimental class will use and receive treatment using the Cogni Anki Flash Card Application in it (Sugiyono, 2017). Meanwhile, the control class is a class which will only use conventional methods. then the researcher will give the same pre-test and post-test to each class to compare the results of the two class groups. So for quasi-experiments using experimental designs and control classes can be (Susanto, 2017).

The research is conducted at SMK Negeri 1 Siantar at grade eleven in 2025/2026 academic year, which is located at Jl. Sangnawaluh KM 3,5, Kec. Siantar, Kabupaten simalungun, North Sumatera. Population and sample have important roles and are interrelated in a study so that it can be examined and conclusions drawn. According to

Ary et.al (Sudjana, 2014) Population and sample refers to all members of a clear group, be it people, events or certain objects while the sample is part of the population. Therefore, it can be said that population and sample are crucial elements in research for generating data (Manihuruk & Siahaan, 2020).

Population refers to the whole group that you aim to make conclusions about. According to Napitupulu, et al (2019:48), population is to identify trends in attitudes, opinions, behaviors, or characteristics of a large group of people. The population to be taken in this study is all eleven grade students of SMK Negeri 1 Siantar in the 2025/2026 academic year. There are 10 classes : 3 Classes of XI TJKT (Teknik Jaringan Komputer dan Telekomunikasi), 3 Classes of XI DKV (Desain Komunikasi Visual), 2 Classes of XI KS (Kecantikan dan Spa) and 2 Classes of XI BS (Busana). The total number of students is 360 (Solihat et al., 2024).

A sample is a group of people or objects that can be taken from a population to represent the whole in a study. According to Creswell (2012), a sample is a subgroup of the target population that the researcher plans to study for generalizing about the target population. In this research will use purposive sampling, which is a technique of determining samples with certain considerations or purposes. There are two classes taken as samples, namely eleventh DKV 1 and eleventh DKV 2, where eleventh DKV 2 is the experimental class and eleventh DKV 1 is the control class. For the experimental class will be used Cogni Anki Flash Card Application (Creswell, 2014).

Research instruments are tools used to obtain data in research. According to Creswell (Schmitt & Schmitt, 2020) research instruments are tools for measuring, observing, or documenting quantitative data. Research instruments are tools used to obtain data in research. In this research, the researcher will use tests to obtain data. Tests are divided into several forms and are divided into two parts, namely pre-test and post-test. Pre-tests will be given to students before treatment is given and post-tests will be given to students after treatment is given to students. The purpose of giving pre-tests and post-tests is to compare the results of both, so that researchers can find out whether treatment using the application can improve students' English vocabulary mastery.

### **3. Result and Discussion**

This chapter presents the results of research on the effect of using Cogni Anki Flash Cards to improve vocabulary mastery at grade eleven of SMK Negeri 1 Siantar. To assess and determine students' vocabulary mastery, the researcher gave students a pre-test and a post-test. Then, the data obtained were reviewed using the data analysis procedures explained in the previous chapter. This chapter consists of several sections, including experimental and control group data, the data analysis process, findings, and discussion (Ramadani et al., 2021).

#### **Data Analysis of The Research**

The data were obtained from eleventh grade students at SMK Negeri 1 Siantar. The researcher used 20 questions, including 10 multiple-choice and 10 fill-in-the-blank questions to measure students' vocabulary mastery. The population was in the eleventh grade of SMK Negeri 1 Siantar and was divided into several groups. From these groups, the

researcher selected samples using purposive sampling. Class XI DKV 2 was chosen as the experimental class consisting of 36 students, while class XI DKV 1 was chosen as the control class consisting of 36 students

### **Paired Sample Test**

Paired samples were used to determine whether the use of Cogni Anki Flash Card application had an effect on students' vocabulary mastery and to see whether there were significant differences between the two class groups.

The table above shows the average pre-test and post-test scores in both classes. The experimental class increased from 46.39 to 83.06, while the control class increased from 48.61 to 66.53. The table above shows the results of a paired sample t-test. The significance value for both classes was 0.000 ( $<0.05$ ), indicating a significant difference between the pre-test and post-test scores in both classes. It can be concluded that there was a significant difference in students' average vocabulary mastery scores between the pre-test and post-test in the experimental class. Meanwhile, the pre-test and post-test in the control class showed a significant difference in the average pre-test and post-test scores, although the increase was smaller (Nurhalimah et al., 2020).

In conclusion, both classes showed a significant difference between pre-test and post-test scores, as indicated by a significance value of 0.000 ( $<0.05$ ). However, the average difference in the experimental class was higher than in the control class. This proves that the use of Cogni Anki Flash Cards is more effective in improving students' vocabulary mastery than conventional teaching.

### **Homogeneity Test**

In this research, the researcher will then conduct a homogeneity test to evaluate the similarity of variance between groups. Based on the results of the homogeneity of variance test (Levene's Test) on the post-test scores of the experimental and control classes, the significance value obtained was 0.000, which is lower than 0.05. This result indicates that the data variances between the two groups were not homogeneous. In other words, there was a significant difference in variance between the experimental and control classes. The implication of this finding is that, when conducting the Independent Samples t-test, the interpretation should be based on the Equal variances not assumed row provided by SPSS. Although the data were not homogeneous, the t-test could still be applied because SPSS automatically adjusts the calculation under unequal variance conditions, ensuring that the analysis remains valid for this research (Nender et al., 2022).

### **Hypothesis test**

This test is used by researchers to verify the research hypothesis. The results of the t-test are declared significant if the p-value or sig (2-tailed) higher than the significance level of sig  $\alpha = 0.05$  (5%), then, the null hypothesis is accepted. While, if the p-value is lower than sig  $\alpha = 0.05$  (5%), taken the alternative hypothesis is accepted.

### **Table 1. Group Statistic Post-Test Both of Classes**

	Class	n	Mean	Std. Deviation	Std. Error Mean
Students' Vocabulary Mastery Result	Experimental Class	6	83.06	4.822	1.904
	Control Class	6	66.53	10.745	4.391

From the table above, it is shown that the average post-test score in the experimental class was 83.06 and the control class was 66.53. Here, the experimental class obtained a higher score than the control class. The standard deviation of the experimental class was (4.822) which was lower than the control class (10.745), this shows that the experimental class students' scores were more consistent, while the control class varied. In addition, the standard error value was smaller in the experimental class, thus proving the average score was more accurate. Thus, therefore, the treatment in the experimental class had a significant influence on students' vocabulary mastery.

**Table 2. Independent Samples Test for Post Test Score Both of Classes**

		Independent samples test					95% Confidence Interval of the Difference	
		Levene's Test for Equality of Variances	f	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Post test	equal variances assumed	6.136	.420	.000	6.528	1.963	2.613	0.44
	not assumed		.420	8.549	.000	6.528	1.963	2.582

The table above presents an independent sample test for the post-test, resulting in a p-value (2-tailed) of 0.000, less than 0.05. Therefore, the null hypothesis ( $H_0$ ) is rejected, while the alternative hypothesis ( $H_1$ ) is accepted because the p-value ( $0.000 < 0.05$ ). This finding indicates that the use of Cogni Anki Flash Cards has a significant influence on students' vocabulary mastery (Napitupulu et al., 2020).

#### Effect Size Formulation

The effect size is then calculated to determine how significant the effect is. The t-test shows the results of statistical significance, while the effect size shows the statistical

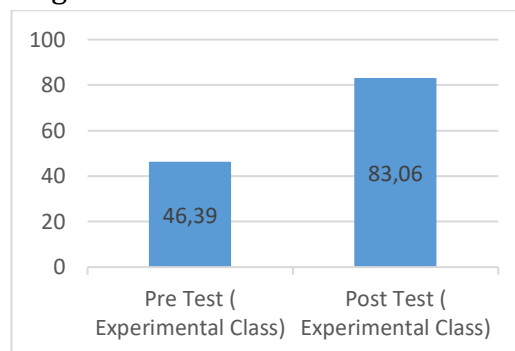
results whether the effect is weak, moderate, or strong. In this research, the researcher used Cohen's d effect size formula as follows:

$$d = \frac{\text{Mean Score of Group A} - \text{Mean Score of Group B}}{\sigma \text{ pooled standard deviation}}$$
$$\sigma \text{ pooled} = \frac{\text{Standard Deviation 1} + \text{Standard Deviation 2}}{2}$$
$$(1) \sigma \text{ pooled} = \frac{4.822 + 10.745}{2} = 7.7835$$
$$(2) d = \frac{83.06 - 46.39}{7.7835} = 0.74 \text{ (moderate effect)}$$

The effect size calculation showed a value of 0.74, indicating a moderate effect. This indicates that the use of Anki Flash Cards had a significant impact on students' vocabulary mastery.

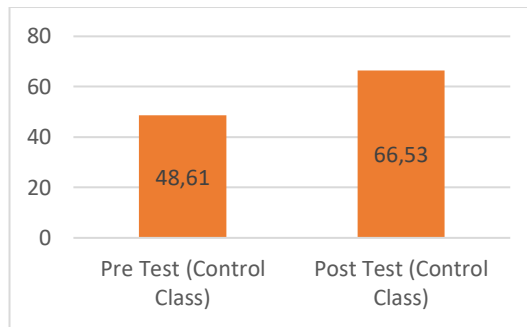
### Research Finding

Based on the data analysis, the researcher found out that the Cogni Anki Flash Card has significant effect on students' vocabulary mastery at grade eleven of SMK Negeri 1 Siantar (Nan, 2018). The Independent samples t-test showed a p-value (2-tailed) of 0.000, less than 0.05. Therefore, the null hypothesis ( $H_0$ ) is rejected, while the alternative hypothesis ( $H_1$ ) is accepted because the p-value ( $0.000 < 0.05$ ). This finding indicates that the use of Cogni Anki Flash Cards has a significant influence on students' vocabulary mastery. The experimental class initially obtained a pre-test score with a minimum of 20 and a maximum of 65 with an average of 46.39 (SD=10.255). After the intervention, the post-test score increased ranging from 75 to 95, with an average of 83.06 (SD 4.822). Meanwhile, the control class initially obtained a pre-test score with a minimum of 20 and a maximum of 65, with an average of 48.61 (SD = 10.864). After being taught with the conventional method, their post-test scores ranged from 45 to 85, with an average of 66.53 (SD 10.745). Although both groups showed improvement, the experimental group's improvement was higher than the control group. This indicates that the use of Cogni Anki Flash Cards has a significant influence on students' vocabulary mastery.



**Figure 1. Comparison of Pre Test and Post Test Mean Scores between Experimental Class**

The experimental class showed a significant increase on students' vocabulary mastery after implementing Cogni Anki Flash Cards. The average score increased from 46.39 in the pre-test to 83.06 in the post-test, representing a 79.05% increase. The results showed that this media significantly improved students' vocabulary mastery.



**Figure 2. Comparison of Pre Test and Post Test Mean Scores between Control Class**

The control class taught using conventional methods, also showed improvement on students' vocabulary mastery. Their average score increased from 48.61 on the Pre-Test to 66.53 on the Post-Test, representing a percentage increase of 36.86%. Although conventional teaching methods contributed to students' learning progress, the improvement was smaller compared to the experimental class. These results indicate that traditional teaching was less effective in improving students' vocabulary compared to the use of Cogni Anki Flash Cards. Overall, these findings strongly suggest that the use of Cogni Anki Flash Cards had a significant impact on improving students' vocabulary mastery compared to conventional teaching methods.

### **Discussion**

Results of students' vocabulary mastery in the experimental class. Before administering the treatment, the researcher first conducted a pre-test to measure their initial vocabulary mastery. The results showed that many students were still at a low level, with 33.3% classified as "very poor." After the Cogni Anki Flash Card media was implemented in the experimental class, students' ability to understand the meaning and significance of vocabulary and use vocabulary in sentences based on its function improved significantly. This finding aligns with Sutra (2024), who demonstrated that the use of Anki was beneficial in enhancing students' vocabulary skills and was perceived as enjoyable and helpful by the students in understanding vocabulary meaning. Furthermore, Andi Asty Fatma Syamsiar (Magfirah, 2023) confirmed that AnkiApp is effective for enhancing vocabulary mastery. Similarly, Nender, A.J. et al. (2022) suggested that the implementation of Anki flashcards was effective in enhancing students' vocabulary acquisition, leading to the recommendation that English teachers incorporate this method into their teaching practices to facilitate better vocabulary retention. and Agnes (2022). D et al. (2024) recommended Anki flashcards to their peers for vocabulary learning. The novelty of this research lies in the application of Cogni Anki Flash Cards as a vocabulary learning medium, where both the application and the treatment are conducted online. This also supports the implementation of a hybrid curriculum that combines online and offline classes, thus providing a more flexible and effective learning experience for senior high school students.

After receiving the treatment, post-test results showed significant improvement. The majority of students advanced to a higher level: 2 (5.6%) achieved the 'excellent'

category, 14 (44.5%) achieved the 'very good' category, and 20 (50.0%) achieved the 'good' category. This indicates that the implementation of Cogni Anki Flashcards effectively improved students' vocabulary mastery.

The results of students' vocabulary mastery in the conventional method (control class) showed relatively little improvement. Although there was progress, achievement remained in the middle and lower categories. Only 3 (8.3%) achieved the 'fairly good' category, 11 students (30.6%) achieved the 'fair' category, 12 students (33.3%) achieved the 'poor' category, and 10 students (27.8%) achieved the 'very poor' category. After the post-test, there was a slight improvement, but the progress was modest: 4 students (11.1%) achieved the 'very good' category, 5 (13.9%) the 'fairly good' category, 10 (27.8%) the 'fair' category, and 3 students (8.3%) the 'poor' category. This indicates that class XI DKV 1, which has been taught only with conventional methods, only made a slight improvement in its scores (Luthfillah & Fauzia, 2023).

Comparing the vocabulary mastery of students in the experimental class using Cogni-anki Flash Cards and the control class using only conventional methods displays a clear contrast. In the control class, students' average pre-test score of 48.61 increased to 66.53, representing a moderate increase of 36.86%. This indicates that while conventional teaching methods did contribute to some level of progress, the overall improvement was limited, with most students remaining in the low to medium achievement category. This demonstrates the limitations of traditional methods in maximizing students' reading comprehension. However, despite their effectiveness in improving vocabulary mastery, Anki's Cogni Flashcards still have several limitations. One is the lack of material covering aspects of word formation, such as blending and compounding, as well as word meanings through translation and synonyms. Furthermore, Anki's Cogni Flashcards also have several features that are only available in the paid version. This limits students to using the free version (Leshin et al., 1992).

In contrast, the experimental class that received treatment and implemented Cogni Anki Flash Cards showed significant improvement, with an average pre-test score of 46.39 increasing to 83.06, a significant increase of 79.05%. This improvement not only demonstrates the effect of Cogni Anki Flash Cards in improving vocabulary mastery but also their ability to create a more engaging learning environment, engaging and motivating students. Post-test results showed that most students achieved higher scores: 2 students (5.6%) achieved the 'excellent' category, 14 (44.5%) were in the 'very good' category, and 20 others (50.0%) were in the 'good' category. These findings demonstrate that Cogni Anki Flash Cards are effective in supporting students in understanding the meaning and significance of vocabulary and using vocabulary in sentences appropriately. This aligns with previous research highlighting the positive impact of learning media applications.

#### **4. Conclusion**

This study aims to determine the effect of Cogni Anki Flash Card to improve students' vocabulary mastery at grade eleven of SMK Negeri 1 Siantar. In this study, researchers collected data from two classes, namely the experimental class that used Cogni Anki Flash

Card media and the control class that only used conventional methods. Then the data were analyzed using descriptive statistics, percentage of score increase, normality and homogeneity tests, paired and independent t-tests, and effect size calculations. Where the results obtained that there was a significant effect of the use of media in the experimental class with the initial pre-test with an average value of 46.39 to 83.06 in the post-test. with the classification of values in the post-test, namely 2 students (5.6%) achieved the 'excellent' category, 14 (44.5%) were in the 'very good' category, and 20 others (50.0%) were in the 'good' category. While in the control class that only used conventional methods where the results obtained were slightly significant but not as big as in the experimental class. The average pre-test score was 48.61, an increase of 66.53, not as significant as in the experimental class. The post-test scores were classified as follows: 4 students (11.1%) achieved the 'very good' category, 5 (13.9%) the 'fairly good' category, 10 (27.8%) the 'fair' category, and 3 students (8.3%) the 'poor' category. In addition, the paired sample t-test and independent sample t-test showed a significant difference in pre-test and post-test scores in both classes. Then the calculation of the effect size (Cohen's  $d = 0.74$ ) showed that the use of Anki Flash Card media had a moderate effect on vocabulary mastery in class XI students at SMK Negeri 1 Siantar.

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