Improving English Vocabulary Mastery Through Flashcards Method for Students at SMK Telkom 2 Medan

Maria Simarmata[1], Natalia W.P. Tarigan[2], Elvira Rosyida M.R[3]
[1,2] Universitas Prima Indonesia, Indonesia
[3] Universitas Negeri Malang, Indonesia

ABSTRACT

The purpose of this study is to investigate how well eleventh-grade students at SMK Telkom 2 Medan can master English vocabulary with the use of flashcards. The kids' limited vocabulary, especially in vocational schools where English instruction is frequently limited by time and less engaging techniques, is what spurred the research. Two groups participated in a quantitative study utilizing a quasi-experimental design: the experimental group was taught vocabulary using flashcards, while the control group was instructed using traditional techniques. Multiple-choice vocabulary questions were used in pre-tests and post-tests to gauge students' development. The results showed that whereas the control group's average score only increased from 49.6 to 62.0, the experimental group's improved significantly from 51.6 to 79.2. The flashcard strategy greatly improved students' vocabulary acquisition, according to statistical studies, including paired sample and independent sample t-tests (t-value = 7.24; p < 0.001). Furthermore, the results of the questionnaire showed that the majority of students thought flashcards helped them comprehend word meanings, memorize vocabulary more rapidly, and enjoy studying. To sum up, using flashcards to teach English vocabulary turned out to be a successful and entertaining visual aid. This strategy is appropriate for vocational school settings because it not only improved retention but also raised students' motivation and active participation.

INTRODUCTION

A fundamental component of language acquisition is the mastery of English vocabulary, which underpins the development of writing, speaking, listening and reading skills. Without an adequate vocabulary, students find it difficult to comprehend texts, express their own thoughts and engage in meaningful communication. As Hatch and Brown (1995) point out, vocabulary is the foundation

of language and communication, while Ur (1998) emphasizes its critical importance for academic achievement and real-world interactions.

Despite its importance, many vocational secondary school (SMK) students, especially at SMK Telkom 2 Medan, have difficulties in mastering English vocabulary. Because the curriculum focuses mainly on practical and technical skills, it is often difficult to devote time and motivation to language learning. Students often have problems with word usage, spelling and comprehension, which are exacerbated by traditional teaching methods, limited exposure to English and a lack of engaging learning materials (Nugroho, Nurkamto & Sulistyowati, 2012). For vocational students, this challenge is particularly pressing as they need to understand both the general and specific vocabulary relevant to their future careers.

Innovative and interactive teaching strategies are needed to overcome these problems. Flashcards have proven to be a promising tool for improving vocabulary learning. Flashcards, defined by Cross (1992) as simple visual aids with text and pictures, are suitable for different learning styles and help to promote engagement and retention. Their effectiveness is supported by empirical research: Nugroho et al. (2012) reported a significant improvement in vocabulary test scores after using flashcards, while Widiastuti (2014) and Atmaja & Sonia (2020) found an increase in student interest, engagement and knowledge using similar interventions. Schmitt and McCarty (1997) also found that memorization and recall of vocabulary is significantly improved by visual aids such as flashcards.

While previous studies have demonstrated the general benefits of flashcards in language learning, there is still a lack of understanding of their specific impact on vocational students in the context of SMK Telkom 2 Medan. The majority of previous studies have not focused on the specific needs and challenges of this target group, nor have they made a systematic comparison of card-based teaching with traditional methods in this context. This study aims to address this gap by investigating the effectiveness of flashcards in improving English vocabulary among eleventh grade students at SMK Telkom 2 Medan.

The aim of this study is to evaluate the effectiveness of flashcards in developing students' vocabulary and to compare the learning outcomes of students taught using flashcards with those of students taught using traditional methods. The central hypothesis is that the use of flashcards leads to a statistically significant improvement in students' vocabulary acquisition compared to traditional teaching. The variables examined include the method of instruction (flashcards vs. traditional instruction) and students' mastery of vocabulary based on pre- and post-test scores. The quasi-experimental study includes two groups: an experimental group using flashcards and a control group using traditional teaching. In order to assess the effects of the intervention, a quantitative analysis of the data is carried out.

To avoid misunderstandings, the term flashcard is used in this study to refer to a learning medium consisting of cards on which words, pictures or a combination of both can be seen - this is intended to support vocabulary learning through interactive and visual approaches. Vocabulary mastery involves students' ability to understand, remember and use English vocabulary correctly in context.

This study aims to develop effective strategies for teaching vocabulary to vocational students in order to promote their academic and professional success. To this end, the use of flashcards in this particular educational context is explored.

RESEARCH METHOD

In this study, two eleventh grade classes of SMK Telkom 2 Medan in the school year 2024/2025 were used as the population. A purposive sampling method was used to select two intact classes based on similar characteristics such as class size, students' English proficiency, and learning environment. Each class comprised 25 students, resulting in a total sample of 50 students evenly divided between an experimental and a control group. A vocabulary test, which included a pre- and post-test assessment, was the main instrument used to collect data. Each test consisted of ten multiple-choice questions designed to assess various vocabulary-related skills, including word recognition, understanding of meaning and appropriate use in context. The same set of questions was used for both the pre-test and the post-test to ensure consistent measurement.

The study utilized a quasi-experimental design that included both pre-test and post-test control groups. The experimental group received vocabulary training with flashcards in six sessions over a six-week period, while the control group continued to use traditional teaching methods such as textbook exercises. At the beginning of the study, both groups took a pre-test to determine their initial vocabulary knowledge. At the end of the treatment phase, a post-test was administered to measure any progress. The pre-test and post-test data were analyzed quantitatively with descriptive statistics such as mean and standard deviation for the results of each group. A paired samples t-test was conducted to test whether there was a significant improvement in vocabulary knowledge in each group. In addition, an independent t-test was conducted to examine the effectiveness of the flashcard method compared to traditional instruction.

To ensure validity, the vocabulary test was designed to correspond to the pupils' curriculum and contain relevant vocabulary. The use of the same set of questions for the pre-test and post-test guaranteed reliability, as this enabled a direct comparison of results. Statistical analyses included a paired-samples t-test for within-group comparisons to assess improvements in vocabulary scores and an independent-samples t-test for between-group comparisons to assess the effectiveness of the flashcard method compared to traditional instruction. The study

was limited to investigating how effective flashcards are in improving the vocabulary of eleventh grade students majoring in culinary arts at SMK Telkom 2 Medan. One of the limitations is the small sample size of 50 students, which could affect the generalizability of the results. In addition, the six-week period might not be sufficient to assess long-term vocabulary retention. Furthermore, no delayed post-test was conducted to evaluate retention over a longer period of time.

RESULT AND DISCUSSION

The table below displays the pre-test and post-test results of the experimental and control classes:

Experimental Group

Table 1.
Experimental Class's Pre-Test and Post-Test Results

No.	Student's Name	Pre-test (X1)	Post-test (X2)
1	AG	60	80
2	AR	60	80
3	AG	40	70
4	AF	50	80
5	CL	70	90
6	ES	60	80
7	EA	70	80
8	FL	40	70
9	KA	50	70
10	MB	50	70
11	MK	60	80
12	MM	40	80
13	NM	70	90
14	NL	50	80
15	NA	30	60
16	NR	60	80
17	RA	70	80
18	RF	80	100
19	RD	40	70
20	SS	70	90
21	SF	80	90
22	SK	50	80
23	SR	60	70
24	ST	70	90
25	MR	40	70
N=25	Total Score	1.290	1.980
	Average	51.6	79.2

The results of the pre-test and post-test provide the information shown in the following table. 30 is the lowest possible score, while 100 is the highest. The formula below is what researchers use to determine the average score:

$$M2 = \frac{\Sigma x^1}{N} = \frac{1290}{25} = 51.6$$

The average pre-test in the experimental class was 51.6, which showed that students' vocabulary was still lacking.

$$M1 = \frac{\Sigma x^2}{N} = \frac{1980}{25} = 79.2$$

The post-test average in the experimental class was 79.2. This shows an improvement from the pre-test.

$$M = M2 - M1 = 79.2 - 51.6 = 27.6$$

The scores above show an improvement in vocabulary knowledge of 27.6 point.

Note : M = mean

N = number of students

X1 = score value for students 1 (pre-test)

M1 = average post-test score

X2 = score value for students 2 (post-test)

M2 = average pre-test score

Determine the following mean from the summation: It seems that the mean scores on the pre-test and post-test (in the experimental group) increased by 27.6.

Control Group

Table 2.
Control Class's Pre-Test and Post-Test Results

No	Student's Name	Pre-test (X1)	Post-test (X2)
1	AA	50	60
2	AS	60	70
3	AZ	40	60
4	CN	60	70
5	CA	60	70
6	DR	50	60
7	DM	30	40
8	IF	60	70
9	JP	50	60
10	KY	30	40
11	KA	50	70
12	MA	30	50

13	MR	40	50
14	MD	60	70
15	PP	70	80
16	PA	50	60
17	RZ	60	70
18	RA	70	80
19	SA	50	60
20	SN	60	70
21	TQ	40	60
22	VR	40	50
23	WA	50	60
24	YD	50	70
25	YS	30	50
N=25	Total Score	1.240	1.550
	Average	49.6	62.0

The results of the pre-test and post-test provide the information shown in the following table. 30 is the lowest possible score, while 80 is the highest. The formula below is what researchers use to determine the average score:

$$M2 = \frac{\Sigma x^1}{N} = \frac{1240}{25} = 49.6$$

The average pre-test in the control class was 49.6, which showed that students' vocabulary was lacking.

$$M1 = \frac{\Sigma x^2}{N} = \frac{1550}{25} = 62.0$$

The post-test average in the control class was 62.0.

$$M = M1 - M2 = 62.0 – 49.6 = 12.4$$

The score above shows an increase in vocabulary knowledge only 12.4 point.

Note : M = mean

N = number of students

X1 = score value for students 1 (pre-test)

M1 = average post-test score

X2 = score value for students 2 (post-test)

M2 = average pre-test score

The experimental group showed a **27.6 point** improvement in mean scores, while the control group improved by only **12.4 point**.

Paired Sample T-test (Within Groups)
- **Experimental Group**

The Paired t-test formula:

$$t = \frac{\overline{D}}{(s_D/\sqrt{n})} = \frac{27.6}{(8.89/\sqrt{25})} = \frac{27.6}{1.778} \approx 15.52$$

Note:

$\overline{D}$ = mean post-test − mean pre-test = 79.2 − 51.6 = 27.6

s_D = 8.89 (standard deviation)

n = 25

Result: *t = 15.52*

- **Control Group**

The Paired t-test formula:

$$t = \frac{\overline{D}}{(s_D/\sqrt{n})} = \frac{12.4}{(7.87/\sqrt{25})} = \frac{12.4}{1.574} \approx 7.88$$

Note:

$\overline{D}$ = mean post-test − mean pre-test = 62.0 − 49.6 = 12.4

s_D = 7.87 (standard deviation)

n = 25

Result**:** *t = 7.88*

Independent Sample T-test (Between Groups):

- The t-test formula between groups:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} = \frac{79.2 - 62.0}{\sqrt{\frac{8.89^2 + 7.87^2}{25 \quad 25}}} = \frac{17.2}{\sqrt{\frac{79.0321 + 61.9369}{25 \quad 25}}} = \frac{17.2}{3.1613 + 2.4775} = \frac{17.2}{\sqrt{5.6388}} = \frac{17.2}{2.3745} \approx 7.24$$

Note:

$\bar{x}_1$ = 79.2 (average post-test ex)

s_1 = 8.89

n_1 = 25

$\bar{x}_2$ = 62.0 (average post-test con)

s_2 = 7.87

n_2 = 25

Result: *t = 7.24 → highly significant (p < 0.001)*

Based on the data results above, it can be said that the grade XI students at SMK Telkom 2 Medan benefited from the use of flashcards to improve their vocabulary acquisition. With a t-value of 15.52, the Paired Sample T-test results of the experimental group showed a significant increase in scores between the pre-test (51.6) and post-test (79.2). Although the increase was not as significant as the experimental group, the control group also experienced an increase from the pre-test score (49.6) to the post-test score (62.0) with a t-value of 7.88. In addition, the results of the Independent Sample T-test between the two groups

howed a t-value of 7.24 (p < 0.001), which showed a very significant difference. These results show that students who used the flashcard approach experienced a very significant improvement in vocabulary acquisition compared to students who did not use the flashcard approach. Therefore, it can be said that the flashcard approach is a practical and successful way to learn vocabulary.

Discussion

The results of this study highlight the value of learning English vocabulary through the use of flashcards. Students' retention and comprehension of new vocabulary were positively impacted by the visual and contextual-based approach using flashcards, as seen by the experimental group's notable score gain. In addition to providing the terms and their definitions, the study's flashcards additionally include sample sentences and descriptive images to aid students in understanding the phrases' context. This lends credence to Paivio's (1986) dual-coding hypothesis, which holds that verbal and visual instruction together can improve pupils' long-term memory. Furthermore, it has been demonstrated that using flashcards increases students' active participation in the learning process. Flashcard word matching games and group quizzes are examples of activities that enhance the learning environment and encourage participation. According to Siso et al. (2022), interactive exercises like this one motivate students to learn more actively and intently, which enhances their vocabulary comprehension and retention. This stands in contrast to traditional approaches, which are typically passive and less effective in encouraging direct student participation.

Additionally, flashcards have various benefits in terms of effectiveness and versatility. They are affordable, simple to create, and applicable to a variety of topics, such as academic phrases, everyday activities, and vocabulary related to technology. Because of their adaptability, flashcards can be used as an effective teaching tool in a range of educational settings, regardless of whether students have access to technology or not. In contemporary settings, digital flashcards like Quizlet even provide students the freedom to learn on their own and at their own pace using electronic devices, opening up possibilities for incorporating technology-based learning into the classroom. Digital flashcards can facilitate hybrid learning, particularly in schools with limited teaching resources, according to Feranty et al. (2024).

This study does have certain drawbacks, though. The findings' generalizability to a larger population is limited by the very small sample size of just 50 students. Furthermore, the six-week intervention period is insufficient to assess language retention over the long run. Additionally, a delayed post-test

to gauge how well children retain newly learned vocabulary over time was not used in this study.

In light of these results, it is recommended that future studies take into account the use of digital flashcards in order to meet the requirements of hybrid or remote learning. To increase the effectiveness of learning, teachers must also receive training in creating curriculum-appropriate and contextual flashcards. To make the findings more reliable and valid in assessing long-term vocabulary retention, future studies should also include a bigger sample size and a longer intervention period.
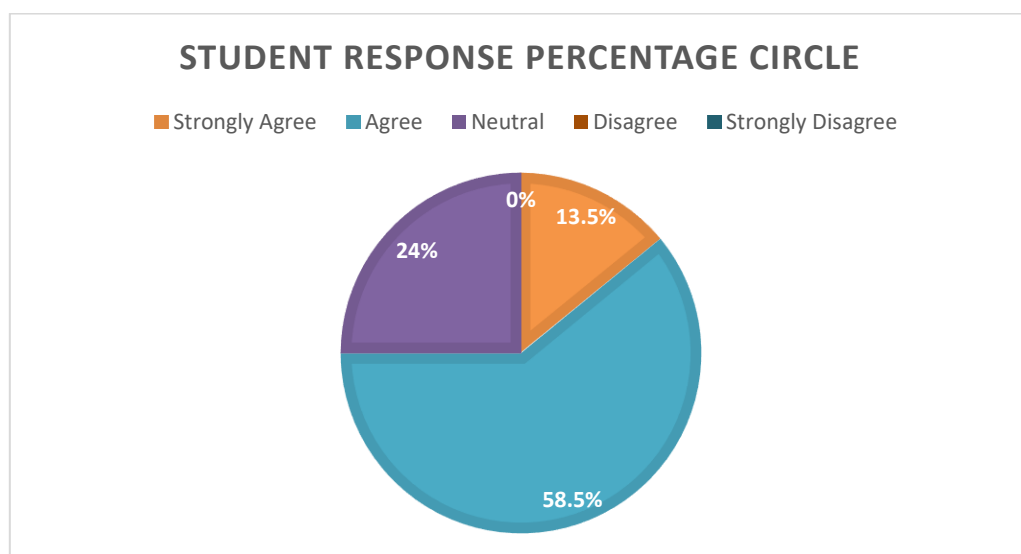
Percentage of Student Responses

The researcher also used a questionnaire and distributed it to students to find out their perspectives, opinions and understanding of the use of flashcards in vocabulary learning. This questionnaire serves as one of the supporting data for this study.

Table 3.
Percentage of Student Responses

No	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	Do flashcards help you understand the meaning of English words more easily?	3 (15%)	13 (65%)	4 (20%)	0 (0%)	0 (0%)
2	Do you memorize vocabulary faster after learning with flashcards?	1 (5%)	13 (65%)	5 (25%)	0 (0%)	0 (0%)
3	Does learning with flashcards make learning more fun?	1 (5%)	12 (60%)	5 (25%)	0 (0%)	0 (0%)
4	Did you become more interested in learning English after using flashcards?	3 (15%)	11 (55%)	5 (25%)	0 (0%)	0 (0%)
5	Do flashcards help you improve your English reading skills?	4 (20%)	11 (55%)	5 (25%)	0 (0%)	0 (0%)
6	Do flashcards					

	make it easier for you to remember the spellings of words?	2 (10%)	12 (60%)	5 (25%)	0 (0%)	0 (0%)
7	Does the use of pictures in flashcards help you understand the vocabulary better?	4 (20%)	11 (55%)	5 (25%)	0 (0%)	0 (0%)
8	Do you think the flashcard method should continue to be used in learning vocabulary?	4 (20%)	11 (55%)	4 (20%)	0 (0%)	0 (0%)
9	Did the flashcards help you understand how to use the vocabulary in sentences?	3 (15%)	11 (55%)	5 (25%)	0 (0%)	0 (0%)
10	Do you find it easier to remember vocabulary you have seen in flashcards?	2 (10%)	12 (60%)	5 (25%)	0 (0%)	0 (0%)
	Average	13.5%	58.5%	24.0%	0.0%	0.0%

STUDENT RESPONSE PERCENTAGE CIRCLE

■Strongly Agree ■Agree ■Neutral ■Disagree ■Strongly Disagree

CONCLUSION

This study clearly shows that flashcards significantly improve the mastery of English vocabulary among eleventh grade students at SMK Telkom 2 Medan. Not only did the students' test scores improve with flashcards, but their motivation and engagement in learning also increased. This result is significant as it provides teachers with a practical and proven strategy to make vocabulary learning more interactive and enjoyable for vocational students who often struggle with language acquisition. The results are consistent with previous research showing that visual and interactive media such as flashcards can help to overcome vocabulary learning difficulties in similar educational contexts. However, the study only focused on one school and a short period of intervention. Therefore, further research is recommended to investigate long-term and broader applications.

REFERENCES

Atmaja, H. T., & Sonia, A. (2020). "Improving Students' Vocabulary Mastery through Flashcard Media at the Seventh Grade Students." *Jurnal Pendidikan Bahasa Inggris*, 8(2), 123-130.

Cross, D. (1992). *A Practical Handbook of Language Teaching*. London: Prentice Hall.

Feranty, L., Anggreini, S., Meylani, T., & Darmawan, I. N. P. (2024). Improving Fifth Grade Students' Vocabulary Ability Using Flashcards at SDN 23 Pangkalpinang. *JET (Journal of English Teaching)*, *10*(1), 51-60.

Hatch, E., & Brown, C. (1995). *Vocabulary, Semantics, and Language Education*. Cambridge: Cambridge University Press.

Nugroho, A. S., Nurkamto, J., & Sulistyowati, R. (2012). "The Effectiveness of Flashcards in Improving Students' Vocabulary Mastery." *Jurnal Pendidikan Bahasa Inggris*, 1(1), 45-53.

Paivio, A. (1986). *Mental representations: A dual coding approach*. Oxford University Press.

Schmitt, N., & McCarthy, M. (1997). *Vocabulary: Description, Acquisition and Pedagogy*. Cambridge: Cambridge University Press.

Siso, D., Mahmud, A., & Laila, F. (2022). The use of flashcards to improve student engagement in vocabulary learning. *Indonesian Journal of English Language Teaching*, 17(1), 88–95.

Ur, P. (1998). *A Course in Language Teaching: Practice and Theory*. Cambridge: Cambridge University Press.

Widiastuti, N. (2014). "The Use of Flashcards in Teaching Vocabulary at Elementary School." *Jurnal Pendidikan dan Pembelajaran*, 21(2), 98-105.