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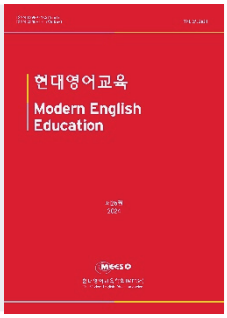


# Korean EFL University Students' Vocabulary Learning: Strategies and Digital Tool Utilization

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**Abstract**

This study investigates the vocabulary learning strategies (VLS) and challenges faced by Korean EFL university students, with an emphasis on digital tool integration. Building on Schmitt (1997) and Laffey (2020), it provides basic statistical analysis to address gaps in prior research on vocabulary learning challenges. This study surveyed 82 engineering students from a national university in South Korea, assessing their use and perceptions of various VLS. Results reveal that students frequently use online and smartphone dictionaries for meaning discovery, while self-study methods such as note-taking and verbal repetition are preferred for vocabulary consolidation. However, a discrepancy exists between the most helpful strategies and those most commonly used. Despite recognizing the effectiveness of digital tools, newer technologies such as artificial intelligence (AI) Bots and Chrome extensions were underutilized. This study highlights the need to integrate both traditional and digital tools into teaching strategies and the importance of familiarizing students with advanced digital resources. Limitations include the small sample size and lack of qualitative data from interviews. Future research should involve larger samples and incorporate qualitative methods to gain deeper insights into students' experiences and VLS effectiveness.

## INTRODUCTION AND BACKGROUND OF THE STUDY

A comprehensive and varied vocabulary is fundamental for effective communication, academic success, and professional growth. It serves as the foundation for intellectual capability and nuanced expression, enabling individuals to comprehend complex material and articulate their thoughts with precision. Vocabulary acquisition is a dynamic process involving continuous exploration, exposure to diverse literature, and engaging in thoughtful conversations. For example, vocabulary knowledge is crucial for intellectual development and subtle expression (Andriani & Sriwahyuningsih, 2019; Hyso & Tabaku, 2011). Students with a broad vocabulary can better understand academic content and express intricate ideas both in written and oral form (Rachmawati, 2018; Zacks & Ferstl, 2016). Additionally, linguistic proficiency impacts professional

success and social dynamics, with a well-developed lexicon signaling professionalism and intellectual aptitude. The process of vocabulary acquisition involves continual growth through diverse reading and meaningful conversations (Saville-Troike, 2012).

In the digital age, the landscape of language learning has undergone significant transformations. Digital tools such as language learning apps, online dictionaries, and multimedia resources have reshaped how students acquire vocabulary, making learning more interactive, accessible, and personalized. These tools offer opportunities for learners to engage with language in ways that were previously impossible, providing instant feedback, gamified learning experiences, and vast resources at their fingertips. However, despite these advancements, learning English vocabulary continues to present challenges for students, particularly in non-native English-speaking contexts.

Building on the groundwork laid by Schmitt (1997) and further developed by Laffey (2020), this study addresses the specific difficulties Korean university students face in learning English vocabulary by providing basic statistical analysis, which was missing in Laffey's (2020) research. While Laffey (2020) addressed difficulties in pronunciation, spelling, usage, and retention, it generalized its results under the label "21st century Korean university students." This broad generalization necessitates a more detailed and context-specific analysis, which the current study aims to provide. By replicating Laffey's work, this study not only explores the vocabulary learning strategies (VLS) used by students to discover the meanings of new words and consolidate their vocabulary knowledge but also evaluates the perceived helpfulness of these strategies.

The current study focuses on engineering students attending a national university in Gyeongbuk in South Korea, where the student population predominantly consists of engineering majors, with only a limited number of business administration students. This demographic was chosen due to its distinct academ6ic focus and the generally lower English proficiency levels observed among these students, based on their university entrance exam scores. This differs significantly from the participants in Laffey (2020), who were from a national university in a metropolitan city and generally had higher high school GPAs and university entrance exam scores. Consequently, this study offers a fresh perspective on vocabulary learning strategies in a different context.

A significant addition in this study is the examination of digital tools such as Chrome extension programs for online dictionaries and translators, which were not considered in Laffey (2020). Given the rapid development of technology between 2020 and 2024, this reflects the evolving landscape of digital-assisted language learning. By investigating the extent to which students use these digital tools and their perceived effectiveness, this research provides insights into how modern learners leverage technology for vocabulary acquisition. Overall, this study aims to offer a comprehensive overview of the challenges and strategies associated with learning English vocabulary, contributing to a better understanding of effective vocabulary learning practices and informing the development of targeted pedagogical interventions to support students in their language learning journeys.

## LITERATURE REVIEW

### Vocabulary Learning Strategies in Second Language Acquisition

Vocabulary learning strategies (VLS) are fundamental to second language acquisition, aiding learners in understanding, acquiring, and retaining new vocabulary. Since the 1980s, researchers have emphasized the significance of these strategies, noting their essential role in language learning (Laufer, 2005). Researchers have categorized VLS into various subgroups, underscoring the importance of selecting effective strategies based on individual needs, goals, preferences, and learning contexts.

Effective VLS are characterized by their appropriateness, adaptability, and efficiency for both the learner and the task (Schmitt, 2010). Successful learners demonstrate flexibility in strategy use, monitor their learning progress, and select appropriate strategies according to the learning context (Gu, 2003). Metacognitive awareness is also a key factor in successful vocabulary learning, with effective learners utilizing a range of techniques to expand and consolidate their vocabulary knowledge (Oxford, 1990).

Researchers (e.g. Gu & Johnson, 1996; Oxford, 1990) have categorized various VLS, encompassing direct strategies like memory techniques, cognitive methods, and compensation strategies, and indirect strategies like metacognitive, affective, and social strategies. These strategies encompass activities such as making contextual guesses, using vocabulary flashcards, employing word analysis techniques, and utilizing dictionaries, all of which contribute to active vocabulary acquisition.

Studies (e.g. Gu & Johnson, 1996; Lai, 2009; Tahmina, 2023) have shown that learners at higher proficiency levels tend to employ a wider range of VLS, including compensation, metacognitive, social, and cognitive strategies, compared to lower

proficiency learners who may rely more on direct strategies like rote memorization. The use of diverse VLS has been linked to improved language performance outcomes, with strategies such as context inference, dictionary usage, note-taking, and word composition positively influencing language test results.

Overall, understanding and effectively utilizing VLS are essential for language learners to enhance their vocabulary acquisition and retention. By incorporating these strategies into language learning activities and leveraging technology such as vocabulary learning apps, learners can optimize their vocabulary learning process and improve their language proficiency levels.

## Vocabulary Learning Strategies in the Digital Era

The digital landscape has profoundly transformed vocabulary acquisition, with language learning applications, online platforms, and interactive resources offering personalized, engaging, and adaptive learning experiences (Anil, 2015; Legi et al., 2023). These tools, including gamification, visual aids, and immediate feedback, significantly enhance motivation and learning efficiency (Ghanbari, 2021; Puspita & Syahria, 2023; Saxena et al., 2021). However, despite these advancements, students continue to face challenges in vocabulary learning (Alhatmi, 2023; Saengpakdeejit, 2014), indicating that the integration of digital tools is not without its complexities. Understanding students' perspectives is crucial for refining digital instruction, ensuring these tools meet diverse learner needs (Khanh & Huong, 2018; OECD, 2016; Tiwari, 2021).

Emerging research underscores the effectiveness of interactive digital formats for vocabulary acquisition (Fithriani, 2021; Jang et al., 2011; Pahamzah, 2022; Yudha & Mandasari, 2021). For instance, Yudha and Mandasari (2021) found gaming beneficial for high school students, while Tran (2023) highlighted TikTok's potential as a vocabulary learning tool. However, more systematic research is required to evaluate the impact of these applications across diverse learner populations, considering the varying contexts in which these tools are employed. A more critical examination of the methodologies in these studies, particularly regarding the efficacy of digital versus traditional VLS, would provide a stronger foundation for understanding the nuances of digital tool integration.

Laffey's (2020) study on Vocabulary Learning Strategies (VLS) among Korean university students, influenced by Schmitt's (1997) taxonomy, delved into the preferences and effectiveness of VLS in a modern context. Surveying 135 undergraduate students in Busan, South Korea, the research identified 66 VLS strategies for meaning discovery and consolidation. The results revealed a diverse range of preferred strategies, with participants showing a slight preference for verbal repetition in consolidation. Notably, strategies like using context clues, various types of dictionaries, and engaging with English language media were highlighted as effective for vocabulary acquisition and retention. The study indicated a nuanced preference among students for a mix of behaviorist conditioning and authentic language input strategies, reflecting the evolving landscape of language learning tools.

However, Laffey's study primarily focused on traditional VLS, with limited exploration of digital tools. This gap is further addressed by Muryani and Yunus (2024), who investigated the complexities of digital vocabulary learning. Despite the availability of abundant resources, students still face significant challenges. Through a narrative inquiry approach, their study uncovers diverse perspectives and experiences, highlighting the importance of motivation and engagement when using digital tools. The research suggests that interactive elements and personalized learning experiences are key to enhancing vocabulary acquisition. Additionally, the study underscores the need for educators to guide students towards suitable digital resources, advocating for a multifaceted approach that combines pedagogical insights with technological innovations.

## The Present Study

Building on the studies presented and as a replication of Laffey (2020), the following research questions have been formulated:

Research Question 1. What difficulties do students have in learning English vocabulary?

Research Question 2. What VLS do students use to discover meanings and consolidate vocabulary?

Research Question 3. What VLS do students find helpful for discovering meanings and consolidating vocabulary?

Research Question 4. To what extent are digital tool-based VLS used and found helpful by students?

# METHOD

## Participants

During the spring semester of 2024, this study examined the perceptions of 82 participants who completed a questionnaire. The participants were among a total of 123 students enrolled in either English Listening and Reading Practice Through CNN News (CNN) or General English Listening (GEL) courses at a national university in South Korea, taught by the researcher. The sample mainly consisted of engineering majors, reflecting the university's predominant student population. The choice of this group was not deliberate but rather a natural outcome of the university's demographics, where students typically have lower English proficiency based on their entrance exam scores. The relatively small sample size limits the generalizability of the results, but the study still provides valuable insights into the VLS used by students in a technical field. CNN is a remote, three-credit course primarily targeting third-year students but open to all years. GEL is a normal face-to-face two-credit course primarily designed for second-year students, though it is also open to all years and is either mandatory or elective depending on the students' major.

**TABLE 1**
*Demographic Data (n = 82)*

| Class | Gender | Year | English proficiency |
|---|---|---|---|
| CNN (*n* = 42) | Male (*n* = 45) | 1st Year (*n* = 2) | Beginner (*n* = 8) |
| GEL (*n* = 40) | Female (*n* = 37) | 2nd Year (*n* = 38) | Basic (*n* = 33) |
| | | 3rd Year (*n* = 35) | Low intermediate (*n* = 26) |
| | | 4th Year (*n* = 7) | High intermediate (*n* = 12) |
| | | | Advanced (*n* = 3) |

42 students from CNN and 40 students from the GEL successfully completed the questionnaire. There were 45 male students and 37 female students. Two students were in the first year; 38 students were in the second year; 35 students were in the third year; and seven students were in the fourth year. Participants were asked to subjectively rate their English proficiency using five options: beginner, basic user, low intermediate, high intermediate, and advanced user. Among them, eight students identified themselves as beginners, 33 as basic users, 26 as low intermediate users, 12 as high intermediate users, and three as advanced users.

## Design of the Study

The survey design in this study was inspired by the methodology outlined by Laffey (2020), which itself drew from the work of Schmitt (1997). Laffey's approach provided a menu of potential Vocabulary Learning Strategies (VLS), allowing participants to indicate whether they used each strategy and whether they found it helpful. In this study, most of the strategies from Laffey's research were retained, but certain meaning discovery strategies were excluded based on their relevance to the current learning context. Specifically, the following strategies were removed:

- Use an electronic dictionary
- Ask a teacher for a translation
- Ask a teacher for a paraphrase or synonym
- Ask a teacher for an example sentence
- Ask a classmate or friend the meaning
- Discover the meaning through group work activity

"Using an electronic dictionary" and "using an online dictionary" are essentially the same, as almost every student now has a cell phone equipped with either an online or offline dictionary. Accordingly, these two strategies were merged into one, "using an online dictionary." The remaining excluded strategies were considered less applicable to the current study's

context, which primarily focuses on independent learning behaviors.
To better capture students' engagement with modern technology, two additional strategies were included:

- Use an artificial intelligence (AI) Bot
- Use a Chrome extension program of an online dictionary or translator

These additions were made to investigate students' perceptions of newer digital tools that reflect recent technological advancements. A comprehensive list of all the strategies included in the survey can be found in the Appendix. The survey was structured to collect data on both the use and perceived helpfulness of each strategy, providing a comprehensive overview of students' vocabulary learning approaches.

All survey items were presented bilingually in English and Korean, utilizing Google Forms to facilitate data collection. The survey was structured into sections, with the first gathering demographic information from participants, followed by sections focusing on the use and perceived helpfulness of meaning discovery and consolidation strategies.

Within these sections, participants were asked to rate their use and perceived helpfulness of the strategies provided. Additionally, participants were prompted to offer suggestions for other VLS at the conclusion of sections focusing on the use of VLS. Similarl y, at the end of sections evaluating the perceived helpfulness of strategies, participants were asked to rate the three most helpful strategies. The survey is available at: https://forms.gle/gjkwhEJwD44TbK8h7.

### Data Collection and Analyses

The survey was conducted midway through the semester, with no specific interventions or instructional methods implemented to enhance students' vocabulary learning strategies. Instead, a written survey questionnaire was utilized to investigate the challenges faced in learning English vocabulary, along with the perceived effectiveness of meaning discovery and consolidation strategies. Data collection involved distributing the survey link to students enrolled in the two courses via the school messenger platform. Participation was voluntary, and while no incentives were offered, students were encouraged to familiarize themselves with the Vocabulary Learning Strategies (VLSs) outlined in the survey for their future studies.

For data analysis, the Statistical Package for the Social Sciences (SPSS) version 25.0 for Windows was employed. Descriptive statistics, including the mean (M) and standard deviation (SD), were calculated to summarize the data for each item. To examine differences in perceived difficulties and strategy use based on independent variables such as gender, academic year, and English proficiency, an Analysis of Variance (ANOVA) was conducted. ANOVA was selected because it is well-suited for comparing means across multiple groups and determining whether there are statistically significant differences between them. To further investigate where specific differences lay, Scheffe's post-hoc test was applied. This test was chosen for its conservative approach, which controls for Type I errors when making multiple comparisons, ensuring that any detected differences are truly significant.

Additionally, frequency analyses were performed to identify which VLSs students used and found helpful, resulting in two types of rankings: a flat numerical ranking based on the frequency of a strategy appearing in the top five, and a weighted ranking, where the #1 spot received five points, the #2 spot four points, and so on. These rankings helped to compare changes in the percentages of respondents' reported use and perceived helpfulness with the results presented by Laffey (2020).

## RESULTS AND DISCUSSION

The results from the data analyses were structured and presented in a way that addressed the research questions.

### Difficulties in Learning English Vocabulary

While Laffey (2020) mentions the difficulties of learning English vocabulary, it does not analyze these difficulties in detail. In contrast, the current study investigates students' perceptions of challenges in learning English vocabulary, focusing on pronunciation, spelling, usage, and retention. Table 2 displays descriptive statistics regarding self-reported difficulties in learning English vocabulary.

**TABLE 2**
*Descriptive Statistics on Difficulties in Learning English Vocabulary (n = 82)*

| Difficulty | Pronunciation | | Spelling | | Usage | | Retention | |
|---|---|---|---|---|---|---|---|---|
| Levels | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| 1 | 10 | 12.2 | 14 | 17.1 | 3 | 3.7 | 11 | 13.4 |
| 2 | 34 | 41.5 | 32 | 39.0 | 23 | 28.0 | 24 | 29.3 |
| 3 | 18 | 22.0 | 21 | 25.6 | 22 | 26.8 | 22 | 26.8 |
| 4 | 14 | 17.1 | 12 | 14.6 | 25 | 30.5 | 18 | 22.0 |
| 5 | 6 | 7.3 | 3 | 3.7 | 9 | 11.0 | 7 | 8.5 |
| *M* | 2.66 | | 2.49 | | 3.17 | | 2.83 | |
| *SD* | 1.125 | | 1.057 | | 1.075 | | 1.174 | |

1. least difficult, 2. somewhat least difficult, 3. average, 4. somewhat difficult, 5. very difficult

The mean scores for self-rated difficulties ranged from 2.49 to 3.17. Specifically, pronunciation, spelling, usage, and retention received ratings of 2.66, 2.49, 3.17, and 2.83, respectively, indicating that these aspects were perceived as moderately challenging by the participants.

To further explore the varying levels of difficulty among these items, factors such as gender, academic year, and English proficiency were considered to identify any potential differences. Table 3 presents statistical analyses of English proficiency on difficulties in learning English vocabulary.

**TABLE 3**
*Statistical Analyses of English Proficiency on Difficulties in Learning English Vocabulary*

| Proficiency (n) | Pronunciation | | Spelling | | Usage | | Retention | |
|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| A (8) | 3.63 | 1.188 | 3.38 | 1.302 | 3.87 | 1.246 | 3.50 | 1.309 |
| B (33) | 2.70 | 1.104 | 2.76 | 1.001 | 3.45 | 0.905 | 3.09 | 1.128 |
| C (26) | 2.42 | 0.945 | 2.12 | 0.909 | 2.92 | 0.935 | 2.50 | 1.175 |
| D (12) | 2.67 | 1.303 | 2.08 | 0.900 | 2.58 | 1.240 | 2.25 | 0.965 |
| E (3) | 1.67 | 0.577 | 2.00 | 1.000 | 2.67 | 1.528 | 3.33 | 0.577 |
| *F* | 2.534 | | 3.820 | | 3.139 | | 2.641 | |
| *p* | .047 | | .007 | | .019 | | .040 | |

A: beginner, B: basic, C: low intermediate, D: high intermediate, E: advanced

The results suggest that there could be notable variations in students' perceptions of difficulty across each item based on their self-rated English proficiency levels. However, Scheffe's post-hoc test revealed no significant differences among specific levels of English proficiency. Further research with more robust data is needed to achieve more reliable results.

## Vocabulary Learning Strategies to Discover Meaning and Consolidate Vocabulary

Following Laffey (2020), the ten most widely used VLS and the five least widely used VLS are highlighted. Since the survey provided only binary options (used/not used), these numbers reflect merely the prevalence of VLS usage and their perceived helpfulness. Table 4 presents the participants' rankings of the most and least frequently used strategies.

**TABLE 4**
*Most Used and Least Used Strategies*

| Rank / 60 | Vocabulary learning strategies | % | Type | Change |
|---|---|---|---|---|
| | *Most used strategies* | | | |
| 1 | Use a smartphone dictionary app | 98.8 | Meaning discovery | 4.7 |
| 2 | Use an online dictionary | 97.6 | Meaning discovery | -0.2 |
| 2 | Use verbal repetition | 97.6 | Consolidation | 4.3 |
| 4 | Study the spelling of the word | 96.3 | Consolidation | 2.2 |
| 5 | Use written repetition | 95.1 | Consolidation | 1.8 |
| 6 | Study the sound of the word | 93.9 | Consolidation | -0.8 |
| 6 | Use the keyword method to remember words | 93.9 | Consolidation | 5.0 |
| 6 | Take notes in class | 93.9 | Consolidation | -2.4 |
| 9 | Compare to a similar known English word | 92.7 | Meaning discovery | -0.6 |
| 9 | Use a bilingual dictionary | 92.7 | Meaning discovery | -4.3 |
| | *Least used strategies* | | | |
| 56 | Ask the teacher to check your flashcards or word list for accuracy | 37.8 | Consolidation | 6.7 |
| 56 | Use a Chrome extension program of an online dictionary or translator | 37.8 | Consolidation | N/A |
| 58 | Use a Chrome extension program of an online dictionary or translator | 34.1 | Meaning discovery | N/A |
| 59 | Use semantic maps like word webs | 32.9 | Consolidation | 1.0 |
| 60 | Put English labels on physical objects | 23.2 | Consolidation | -1.2 |

Using a smartphone dictionary app was the most frequently used strategy among the students in the current study, reflecting an increase of 4.7% compared to Laffey (2020). Using an online dictionary and verbal repetition both ranked second with the same score (97.6), with the former decreasing by 0.2% and the latter increasing by 4.3%. Studying the spelling of the word ranked fourth with a score of 96.3, and using written repetition ranked fifth with 95.1. Studying the sound of the word, using the keyword method to remember words, and taking notes in class all ranked sixth with 93.9. Notably, using the keyword method to remember words increased by 5.0 points, likely because identifying key words from either aural or written passages was a central activity for developing listening and/or reading abilities in the researcher's class. While this activity is not directly related to vocabulary learning, students seemed to connect the two. Lastly, both comparing a word to a known English equivalent and utilizing a bilingual dictionary ranked ninth. each receiving a score of 92.7.

As for the least frequently used VLS, the numbers ranged from 23.2 to 37.8. These strategies include asking the teacher to check flashcards or a word list for accuracy (37.8), using a Chrome extension program (*Naver, DeepL*) of an online dictionary or translator for consolidation (37.8), using a Chrome extension program (*Naver, DeepL*) of an online dictionary or translator for meaning discovery (34.1), using semantic maps like word webs (32.9), and putting English labels on physical objects (23.2). While using a Chrome extension program (*Naver, DeepL*) of an online dictionary or translator was newly included in the current study, it ranked lower (37.8 and 34.1) compared to other digital-aided strategies such as using a smartphone dictionary app (98.8) and using an online dictionary (97.6). This may be because, unlike web- or app-based dictionaries, extension programs are still unfamiliar to students. Additionally, not all students use Chrome as their main browser, with some preferring MS Edge or other browsers.

The results suggest a strong preference for digital tools, particularly those offering mobility and convenience, like smartphone apps. This preference was also observed in Laffey (2020), indicating a consistent trend among students towards mobile and easily accessible tools. Meanwhile, traditional methods like verbal and written repetition maintain their relevance, highlighting a blend of new and conventional approaches in vocabulary learning.

However, the underutilization of certain digital tools, such as AI Bots and Chrome extensions, warrants further attention. This limited use may indicate unfamiliarity or a lack of awareness among students about these newer technologies, which

could be affecting their engagement with and perceived value of these tools. The results suggest that while students are inclined to adopt digital solutions, they may require more guidance or training to fully benefit from these advanced resources. The least used strategies offer valuable insights into areas where students might not see immediate benefits or where the tools may not yet have gained sufficient traction. This suggests potential avenues for further exploration, particularly in understanding the barriers to adopting these strategies and identifying ways to enhance their appeal and effectiveness. This pattern of mixed preferences and underutilized strategies mirrors the results in Laffey (2020), emphasizing that while technology in education continues to advance, there remains a need to ensure that students are fully equipped to leverage both traditional and emerging methods effectively.

## Vocabulary Learning Strategies That Would Be Helpful for Meaning Discovery and Vocabulary Consolidation

Like the most and least used strategies, the survey provided a binary option of helpful/not helpful. Table 5 shows the participants' ranking of the most and least used strategies.

**Table 5**
*Most Helpful and Least Helpful Strategies*

| Rank / 60 | Vocabulary learning strategies | % | Type | Change |
|---|---|---|---|---|
| | *Most helpful strategies* | | | |
| 1 | Use an online dictionary | 92.7 | Meaning discovery | -6.6 |
| 1 | Study the spelling of the word | 92.7 | Consolidation | 5.3 |
| 3 | Use a smartphone dictionary app | 91.5 | Meaning discovery | 1.1 |
| 3 | Study the sound of the word | 91.5 | Consolidation | -0.4 |
| 4 | Use verbal repetition | 91.5 | Consolidation | -4.1 |
| 6 | Compare to a similar known English word | 90.2 | Meaning discovery | -0.2 |
| 6 | Guess from context clues | 90.2 | Meaning discovery | -3.1 |
| 6 | Imagine the word's meaning | 90.2 | Consolidation | -3.9 |
| 6 | Use the keyword method to remember words | 90.2 | Consolidation | 0.6 |
| 6 | Use written repetition | 90.2 | Consolidation | -3.9 |
| | *Least helpful strategies* | | | |
| 56 | Use semantic maps like word webs | 62.2 | Consolidation | 9.6 |
| 56 | Use an AI Bot | 56.1 | Consolidation | N/A |
| 58 | Use a Chrome extension program of an online dictionary or translator | 48.8 | Meaning discovery | N/A |
| 59 | Use a Chrome extension program of an online dictionary or translator | 41.5 | Consolidation | N/A |
| 60 | Put English labels on physical objects | 35.9 | Consolidation | -24.1 |

Using an online dictionary and studying the spelling of a word were the two most helpful strategies (92.7) among the students, decreasing by 6.6% and increasing by 5.3% respectively from Laffey (2020). Using a smartphone dictionary app, studying the sound of a word, and using verbal repetition ranked third with the same score (91.5). Comparing a word to a known English equivalent, guessing from context clues, imagining the word's meaning, using the keyword method to remember words, and using written repetition all ranked sixth with the same score (90.2).

As for the least helpful VLS, the numbers were widely distributed, ranging from 35.9 to 62.2. These include using semantic maps like word webs (62.2), which decreased by 9.6% from Laffey (2020). Using an AI Bot (56.1) and using a

Chrome extension program of an online dictionary or translator (48.8 and 41.5) were newly included in the current study. Notably, using a Chrome extension program of an online dictionary or translator appeared among the least helpful strategies as it did among the least used strategies. Lastly, putting English labels on physical objects ranked as the least helpful strategy (35.9).

The study highlights a preference for digital tools and traditional methods that emphasize phonological and orthographic aspects of vocabulary learning. While some newer strategies are not yet widely adopted or deemed helpful, this may change as students become more familiar with them. The results suggest that educators should continue to promote effective digital resources while also encouraging deeper cognitive engagement through strategies like context clues and the keyword method. Future research could explore ways to increase the adoption and effectiveness of less familiar strategies, potentially enhancing the overall vocabulary learning experience for students.

Table 6 shows the ratings for the meaning discovery VLS, while Table 7 shows the ratings for consolidation VLS.

**Table 6**

*Meaning Discovery Helpfulness Ratings Results*

| Strategy | Numerical rating / 82 max | Weighted rating / 410 max |
|---|---|---|
| Guess from context clues | 37 | 158 |
| Compare to a similar word in your native language | 33 | 135 |
| Compare to a similar known English word | 32 | 122 |
| Analyze the root word and any affixes | 28 | 110 |
| Analyze the part of speech | 24 | 101 |
| Use a smartphone dictionary app | 20 | 83 |
| Use a bilingual dictionary | 20 | 78 |
| Use an online translator | 15 | 55 |
| Analyze any available pictures or gestures | 10 | 38 |
| Use a monolingual English dictionary | 7 | 28 |
| Use an online dictionary | 7 | 28 |
| Use an AI Bot | 6 | 22 |
| Use a Chrome extension program of an online dictionary or translator | 2 | 7 |

Table 6 presents the helpfulness ratings for various Meaning Discovery Vocabulary Learning Strategies (VLS) based on both numerical and weighted scores. In this table, participants' preferences are highlighted, reflecting their perceptions of the effectiveness of different strategies in discovering word meanings. Among the survey participants, the most favored strategy for meaning discovery is guessing from context clues, which leads both the numerical (37 out of 82) and weighted (158 out of 410) rankings. This suggests that students rely heavily on contextual understanding to infer word meanings. Comparing to a similar word in their native language is also highly rated, ranking second numerically (33) and in weighted scores (135). This indicates a strong preference for leveraging knowledge of their first language to understand new English vocabulary. The third most helpful strategy is comparing to a similar known English word, with a numerical score of 32 and a weighted score of 122, showing that students find it beneficial to relate new words to familiar ones.

Analyzing the root word and any affixes (prefixes and suffixes) is the next strategy, scoring 28 numerically and 110 in weighted rankings. This demonstrates that understanding word structure is a common and useful approach for students. Analyzing the part of speech (noun, verb, adjective, etc.) follows closely with a numerical score of 24 and a weighted score of 101, highlighting the importance of grammatical context in meaning discovery. Using a smartphone dictionary app and a bilingual dictionary both share a numerical score of 20, with weighted scores of 83 and 78, respectively. These tools are commonly used, reflecting their accessibility and convenience for students. Using an online translator (*Google Translate, Papago, DeepL*) scores 15 numerically and 55 in weighted rankings, indicating some reliance on digital translation tools despite their lower ranking compared to dictionaries. Analyzing available pictures or gestures scores 10 numerically and 38 in weighted rankings, suggesting that visual aids are sometimes helpful but less frequently relied upon. Using a monolingual

English dictionary and using an online dictionary both score seven numerically, with weighted scores of 28. These resources are used, though they rank lower compared to bilingual dictionaries and smartphone apps. Using an AI Bot scores 6 numerically and 22 in weighted rankings, reflecting minimal use and perceived helpfulness among students. Lastly, using a Chrome extension program (*Naver, DeepL*) of an online dictionary or translator scores the lowest, with two numerically and seven in weighted rankings. This suggests that such extensions are relatively unfamiliar and less utilized by students for meaning discovery.

Overall, the study reveals students' strong preference for contextual and linguistic strategies in learning vocabulary. Guessing from context clues is the most favored as in Laffey (2020), emphasizing the need to teach effective contextual inference. Comparing new words to known words in both native and English languages is also popular, highlighting the value of connecting new vocabulary to existing knowledge. Strategies involving word structure and grammar are essential, reflecting the importance of incorporating these elements into instruction. Digital tools like smartphone dictionary apps and bilingual dictionaries are widely used for their convenience, while less familiar tools like AI Bots and Chrome extensions show potential for increased use with better integration. These insights suggest a balanced approach to vocabulary teaching, combining contextual, linguistic, and technological strategies for optimal learning.

**Table 7**
*Consolidation Strategy Helpfulness Ratings Results*

| Strategy | Numerical rating / 82 max | Weighted rating / 410 max |
|---|---|---|
| Interact with a native speaker | 37 | 126 |
| Study and practice the meaning in a group | 18 | 70 |
| Study the sound of the word | 23 | 70 |
| Use verbal repetition | 20 | 63 |
| Imagine the word's meaning | 18 | 62 |
| Study the word with a picture of the meaning | 23 | 60 |
| Connect the word to a personal experience of yours | 17 | 57 |
| Study the spelling of the word | 17 | 55 |
| Use written repetition | 19 | 50 |
| Ask the teacher to check your flashcards or word list for accuracy | 16 | 49 |
| Associate the word with its coordinates | 14 | 45 |
| Connect the word to its synonyms and antonyms | 11 | 44 |
| Continue to study the word over time | 13 | 35 |
| Imagine the word form/spelling | 11 | 31 |
| Use English-language media | 11 | 30 |
| Say the new word aloud when studying | 10 | 28 |
| Test yourself with word tests | 11 | 27 |
| Use the keyword method to remember words | 11 | 25 |
| Use new words in sentences | 5 | 18 |
| Group words together within a storyline | 5 | 18 |
| Paraphrase the word's meaning | 6 | 18 |
| Group words together spatially on a page | 5 | 17 |
| Remember the affixes and roots | 6 | 17 |
| Group words together to study them | 5 | 16 |

| Strategy | Numerical rating / 82 max | Weighted rating / 410 max |
|---|---|---|
| Take notes in class | 7 | 14 |
| Use an online translator | 5 | 14 |
| Use word lists | 4 | 13 |
| Use an online language learning program | 4 | 13 |
| Use an online dictionary | 4 | 13 |
| Study the configuration of the new word | 6 | 12 |
| Learn the words of an idiom or phrase together | 5 | 11 |
| Keep a vocabulary notebook | 4 | 11 |
| Use "scales" for gradable adjectives | 3 | 10 |
| Underline the initial letter of the new word | 5 | 10 |
| Use cognates while you study | 4 | 10 |
| Use the vocabulary section in your textbook | 4 | 10 |
| Use a smartphone language learning app | 4 | 10 |
| Use physical action when learning words | 2 | 8 |
| Use flash cards | 2 | 8 |
| Use an AI Bot | 3 | 8 |
| Use semantic maps like word webs | 3 | 6 |
| Remember the part of speech | 2 | 5 |
| Listen to a recording of the word | 3 | 5 |
| Use spaced word practice | 1 | 4 |
| Skip or pass the new word | 2 | 3 |
| Put English labels on physical objects | 1 | 1 |
| Use a Chrome extension program of an online dictionary or translator | 0 | 0 |

Among the survey participants, interacting with a native speaker is perceived as the most helpful strategy, leading both the numerical (37 out of 82) and weighted (126 out of 410) rankings. This preference underscores the value students place on direct communication with fluent speakers for reinforcing vocabulary. Studying and practicing the meaning in a group ranks second in numerical scores (18) and fourth in weighted scores (70). This indicates that collaborative learning environments are highly beneficial for vocabulary consolidation. Studying the sound of the word is another prominent strategy, with a numerical score of 23 and a weighted score of 70, reflecting the importance of auditory reinforcement. Using verbal repetition scores 20 numerically and 63 in weighted rankings, emphasizing the effectiveness of repeatedly saying the word out loud. Imagining the word's meaning ranks high, with scores of 18 numerically and 62 in weighted ratings, showing that visualization techniques are widely used and perceived as effective. Studying the word with a picture of its meaning scores 23 numerically and 60 in weighted rankings, highlighting the usefulness of visual aids in vocabulary retention. Connecting the word to a personal experience scores 17 numerically and 57 in weighted scores, illustrating the impact of personal relevance in learning new words.

Studying the spelling of the word scores 17 numerically and 55 in weighted rankings, indicating that orthographic representation is a key aspect of learning. Using written repetition ranks slightly higher numerically (19) but lower in weighted scores (50), showing some divergence between perceived and actual use. Asking the teacher to check flashcards or word lists scores 16 numerically and 49 in weighted rankings, reflecting the value of teacher feedback. Associating the word with its coordinates (e.g., rabbit – mouse) scores 14 numerically and 45 in weighted rankings, showing moderate use and effectiveness. Connecting the word to synonyms and antonyms scores 11 numerically and 44 in weighted rankings,

indicating this strategy's relevance for nuanced understanding. Continuing to study the word over time scores 13 numerically and 35 in weighted rankings, highlighting the importance of spaced repetition. Imagining the word form/spelling and using English-language media both score 11 numerically, with weighted scores of 31 and 30 respectively, indicating varied but significant use. Saying the new word aloud while studying and testing oneself with word tests both score ten numerically, with weighted scores of 28 and 27 respectively, showing consistent practice. Using the keyword method to remember words scores 11 numerically and 25 in weighted rankings, indicating some use of mnemonic devices. The remaining strategies, such as using new words in sentences, grouping words, paraphrasing meanings, taking notes, and others, show varying degrees of use and perceived helpfulness, with generally lower numerical and weighted scores.

The results highlight that students find direct interaction with native speakers and collaborative group study to be the most effective for vocabulary consolidation. Auditory reinforcement, through studying the sound of words and verbal repetition, is also crucial. Visualization techniques, such as imagining meanings and using pictures, are highly rated, emphasizing the role of visual aids. Personal connections and traditional methods, like studying spelling and written repetition, remain important. Strategies involving consistent review over time highlight the necessity of spaced repetition. These insights suggest that a blend of social interaction, auditory and visual reinforcement, personal relevance, and traditional study techniques is most effective for vocabulary learning.

### Digital Tool-Based VLS That Are Used and Found Helpful by Students

The study's results reveal that digital tools play a significant role in vocabulary learning strategies (VLS) among students. Among the top strategies for meaning discovery and consolidation, several digital tools are prominently featured, indicating their widespread use and perceived helpfulness. Smartphone dictionary apps are the most frequently used strategy, showing a significant increase from previous studies. With a usage score of 98.8, these apps are valued for their convenience, accessibility, and comprehensive features. The high frequency of use reflects modern learners' preference for mobile technology, which allows quick and efficient access to word meanings anytime and anywhere. This reliance on smartphone apps underscores their role as an indispensable tool in contemporary vocabulary learning. Similarly, online dictionaries rank highly in both usage and helpfulness. Their high ranking indicates that students appreciate the detailed definitions, example sentences, and additional resources these platforms provide. The continued popularity of online dictionaries suggests they remain a trusted and effective resource for students seeking to discover and understand new words.

On the other hand, newer digital tools, such as AI Bots and Chrome extension programs for online dictionaries and translators, also featured in the study, though they ranked lower in both use and helpfulness, with scores of 56.1 and 48.8, respectively. The lower rankings may be attributed to unfamiliarity or a lack of awareness among students. However, as these tools become more sophisticated and user-friendly, their popularity and perceived helpfulness may increase. Future research or data collection through semi-structured questionnaires, interviews, or literature reviews could provide more concrete evidence to support this observation.

Overall, digital tools are integral to modern students' vocabulary learning strategies, with smartphone dictionary apps and online dictionaries leading the way in both usage and perceived helpfulness. These tools offer convenience, comprehensive information, and interactive features that enhance the vocabulary learning experience, especially when students are familiar with them.

## CONCLUSION

The study provides comprehensive insights into students' vocabulary learning strategies (VLS) and the challenges they encounter in learning English vocabulary, addressing the research questions systematically. Firstly, in response to the first research question, the investigation into students' perceptions of challenges focused on pronunciation, spelling, usage, and retention, which were perceived as moderately challenging by the participants. Factors such as gender, academic year, and English proficiency were considered to identify potential differences in perceived difficulty. Although notable variations were suggested based on self-rated English proficiency levels, Scheffe's post-hoc test did not reveal significant differences between specific proficiency levels, indicating the need for further research with more robust data.

Secondly, the study explored the second research question by investigating the VLS students use for meaning discovery and consolidation. The most commonly used strategy was the smartphone dictionary app, which showed an increase in popularity compared to Laffey's earlier results. Online dictionaries and verbal repetition were also frequently used, with the former seeing a slight decrease and the latter an increase in usage. While studying spelling and using written repetition were

also popular, they were used to a lesser extent. Notably, the keyword method saw a significant rise in usage, likely because it was integrated into class activities, even though it wasn't directly related to vocabulary learning. On the other hand, the least relied upon strategies involved seeking help from teachers or group work, with the lowest-ranked strategy being the use of flashcards, which are typically intended for consolidation rather than discovery. For consolidation, the top strategies were self-study methods such as note-taking, learning the pronunciation and spelling of words, and verbal and written repetition. These strategies are particularly useful in an EFL environment like Korea, where opportunities to interact in the second language (L2) are limited. Interestingly, strategies involving social interaction or English language media were used less frequently, despite being considered helpful by the participants.

Thirdly, addressing the third research question, students identified several VLS as particularly helpful for both discovering and consolidating vocabulary. Using an online dictionary and studying the spelling of a word were rated as the most helpful strategies, with many students appreciating the detailed definitions and example sentences provided by online dictionaries and the orthographic reinforcement from spelling practice. Other highly rated strategies included using a smartphone dictionary app, valued for its accessibility and convenience, studying the sound of a word to reinforce auditory learning, and using verbal repetition to enhance retention through repeated practice. Interestingly, both online dictionaries and smartphone dictionary apps were among the most frequently used strategies, but there may be some overlap in how students perceive and report these tools. The potential confusion between "online dictionary" and "smartphone dictionary" suggests that students may not always differentiate between accessing a dictionary through a web browser and using a dedicated app. This highlights the importance of clarifying the distinctions between these resources so that students can make the most informed choices in their vocabulary learning strategies.

Lastly, in response to the fourth research question, the study emphasized the significant role digital tools play in students' VLS, with smartphone dictionary apps and online dictionaries being the most frequently used and highly valued for their convenience, accessibility, and comprehensive features. The study also included newer digital tools such as AI Bots and Chrome extension programs for online dictionaries and translators. However, these newer tools ranked lower in both usage and helpfulness, likely due to unfamiliarity or lack of awareness among students. Despite their current lower ranking, these tools have the potential to become more integral to vocabulary learning as they become more sophisticated and user-friendly.

Overall, the study highlights the importance of both traditional and digital tools in vocabulary learning. Educators should consider integrating these tools into their teaching strategies to enhance students' vocabulary acquisition and retention. The results align with Laffey's (2020) in recognizing the effectiveness of online dictionaries and smartphone dictionary apps, as well as the importance of self-study methods such as verbal and written repetition. Additionally, the inclusion of newer digital tools in this study, such as Chrome extension programs, reflects an evolution in VLS that Laffey's study began to explore. However, it turned out that students reported they rarely used these newer tools and found them unhelpful, possibly due to a lack of familiarity. This indicates a growing trend towards integrating advanced digital resources in vocabulary learning, but also underscores the need for better introduction and training for these tools. This replication thus not only confirms several of Laffey's observations but also expands upon them by highlighting emerging tools and changing patterns in student preferences.

## Pedagogical Implications

Based on the study's results, several pedagogical implications can be drawn to enhance English vocabulary learning. Firstly, although these difficulties were not perceived as very large overall, educators should still proactively address these challenges. For example, teachers can incorporate targeted activities like pronunciation drills, spelling tests, and interactive exercises that focus on common problem areas. Integrating both traditional methods and digital tools that offer pronunciation guides and spelling aids, such as language learning apps or specialized software, can help students overcome these difficulties more effectively.

Secondly, self-study methods such as verbal and written repetition, studying the spelling and sound of words, and note-taking are particularly effective for vocabulary learning. Teachers should emphasize these methods in their lessons and provide structured opportunities for students to practice them regularly. For instance, assigning regular homework that involves these strategies or integrating them into classroom activities can significantly enhance vocabulary retention and recall. Teachers might also create personalized learning plans that encourage students to engage in these self-study methods outside of class.

Thirdly, educators should actively incorporate vocabulary learning strategies that have been found helpful for both meaning discovery and consolidation. Strategies like the keyword method, guessing meanings from context clues, and comparing new words to familiar ones can be integrated into classroom activities. For example, teachers can design tasks

where students use context to infer word meanings or create keyword associations as part of vocabulary-building exercises. Additionally, teachers could demonstrate how to take meaningful notes that link new vocabulary to existing knowledge, further reinforcing these strategies.

Lastly, digital tools play a significant role in students' vocabulary learning strategies. The frequent and effective use of smartphone dictionary apps and online dictionaries suggests that these resources should be integrated into classroom instruction. Teachers can encourage students to use these digital aids by incorporating them into class assignments, such as asking students to use an online dictionary for vocabulary exercises or encouraging the use of dictionary apps during reading tasks. However, to maximize the effectiveness of newer digital tools like AI Bots and Chrome extension programs, proper introduction and training are essential. Teachers can demonstrate how to integrate these tools into daily learning practices, helping students become familiar with their features and benefits.

By taking these steps, educators can better support students in overcoming vocabulary learning challenges and making the most of both traditional and digital learning resources.

## Limitations and Further Study

While this study offers valuable insights, we need to acknowledge several limitations. The survey was completed by only 82 participants, potentially limiting the applicability of the results. Furthermore, the absence of individual interview sessions and the reliance solely on written surveys, even with some narrative questions included, limited the depth of qualitative data. This limitation may have hindered a more nuanced understanding of students' experiences and perceptions, potentially overlooking the complexities and contextual factors that qualitative methods could have uncovered. Moreover, the study relies on self-reported data, which could introduce biases, such as social desirability bias or inaccurate self-assessment, potentially affecting the reliability of the results.

Future research should address these limitations by involving a larger sample size and incorporating individual interviews to obtain a more detailed and in-depth understanding of students' vocabulary learning strategies and challenges. Since this study is a replication of Laffey (2020), future studies could expand upon these results by comparing them with results from other contexts or demographic groups. This would help determine whether the observed trends are consistent across different populations or unique to this specific group of Korean EFL students. Additionally, investigating the role of advanced digital resources, such as AI Bots and Chrome extensions, through experimental designs could offer a clearer picture of their impact on vocabulary acquisition. Further exploration of the influence of metacognitive strategies and the integration of gamification and interactive elements in digital learning tools would also be beneficial. Lastly, comparing VLS and digital tool usage across different fields of study and proficiency levels could provide a more comprehensive understanding of the diverse needs and preferences of EFL learners, guiding the development of more tailored and effective vocabulary learning interventions.

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## Appendix

*Vocabulary Learning Strategy Use and Perceived Helpfulness Survey Data*

| Vocabulary learning strategy (N = 82) | Use Mean | *SD* | % Change | Helpful Mean | *SD* | % Change |
|---|---|---|---|---|---|---|
| *Meaning discovery strategies* | | | | | | |
| Analyze the part of speech | 0.793 | 0.408 | 13.3 | 0.707 | 0.789 | 11.5 |
| Analyze the root word and any affixes | 0.695 | 0.463 | 7.5 | 0.659 | 0.860 | 11.1 |
| Compare to a similar word in your native language | 0.841 | 0.367 | -0.4 | 0.817 | 0.610 | -3.9 |
| Compare to a similar known English word | 0.927 | 0.262 | 0.6 | 0.902 | 0.540 | 0.2 |
| Analyze any available pictures or gestures | 0.671 | 0.473 | 9.9 | 0.817 | 0.679 | -5.4 |
| Guess from context clues | 0.890 | 0.315 | 5.1 | 0.902 | 0.540 | 3.1 |
| Use a bilingual dictionary | 0.927 | 0.262 | 4.3 | 0.866 | 0.615 | 6.7 |
| Use a monolingual English dictionary | 0.646 | 0.481 | 13.2 | 0.695 | 0.849 | 13.5 |
| Use a smartphone dictionary app | 0.988 | 0.110 | -4.7 | 0.915 | 0.500 | -1.1 |
| Use an online dictionary | 0.976 | 0.155 | 0.2 | 0.927 | 0.416 | 6.6 |
| Use an online translator | 0.915 | 0.281 | -1.9 | 0.866 | 0.531 | -10.3 |
| Use an AI Bot | 0.634 | 0.485 | N/A | 0.646 | 0.871 | N/A |
| Use Chrome extension program of an online dictionary or translator | 0.341 | 0.477 | N/A | 0.488 | 0.981 | N/A |
| *Consolidation strategies* | | | | | | |
| Study and practice the meaning in a group | 0.451 | 0.501 | 6.0 | 0.671 | 0.473 | -10.1 |
| Ask the teacher to check your flashcards or word list for accuracy | 0.378 | 0.488 | -6.7 | 0.646 | 0.481 | -6.1 |
| Interact with a native speaker | 0.549 | 0.501 | 26.6 | 0.756 | 0.432 | 17.0 |
| Study the word with a picture of the meaning | 0.671 | 0.473 | -3.4 | 0.805 | 0.399 | -4.9 |
| Imagine the word's meaning | 0.927 | 0.262 | -3.1 | 0.902 | 0.299 | 3.9 |
| Connect the word to a personal experience of yours | 0.805 | 0.399 | 8.4 | 0.890 | 0.315 | 2.9 |
| Associate the word with its coordinates | 0.610 | 0.491 | 11.6 | 0.780 | 0.416 | -3.9 |
| Connect the word to its synonyms and antonyms | 0.805 | 0.399 | 9.9 | 0.854 | 0.356 | 5.7 |
| Use semantic maps like word webs | 0.329 | 0.473 | -1.0 | 0.622 | 0.488 | -9.6 |
| Use "scales" for gradable adjectives | 0.561 | 0.499 | 3.2 | 0.707 | 0.458 | 4.9 |
| Group words together to study them | 0.622 | 0.488 | 17.8 | 0.707 | 0.458 | 14.5 |
| Group words together spatially on a page | 0.524 | 0.502 | 9.8 | 0.634 | 0.485 | 10.7 |
| Use new words in sentences | 0.439 | 0.499 | 36.1 | 0.720 | 0.452 | 19.9 |
| Group words together within a storyline | 0.634 | 0.485 | 3.3 | 0.793 | 0.408 | - |
| Study the spelling of the word | 0.963 | 0.189 | -2.2 | 0.927 | 0.262 | -5.3 |
| Study the sound of the word | .939 | 0.241 | 0.9 | 0.915 | 0.281 | 0.4 |
| Say the new word aloud when studying | 0.890 | 0.315 | 2.1 | 0.866 | 0.343 | 5.3 |
| Imagine the word form/spelling | 0.878 | 0.329 | -3.4 | 0.878 | 0.329 | -3.4 |
| Underline the initial letter of the new word | 0.549 | 0.501 | -14.9 | 0.768 | 0.425 | -35.3 |

| Vocabulary learning strategy (N = 82) | Use Mean | *SD* | % Change | Helpful Mean | *SD* | % Change |
|---|---|---|---|---|---|---|
| Study the configuration of the new word | 0.768 | 0.425 | 1.7 | 0.841 | 0.367 | -7.1 |
| Use the keyword method to remember words | 0.939 | 0.241 | -5.0 | 0.902 | 0.299 | -0.6 |
| Remember the affixes and roots | 0.671 | 0.473 | 7.0 | 0.732 | 0.446 | -0.6 |
| Remember the part of speech | 0.793 | 0.408 | 5.9 | 0.756 | 0.432 | 2.2 |
| Paraphrase the word's meaning | 0.671 | 0.473 | 4.0 | 0.744 | 0.439 | 1.2 |
| Use cognates while you study | 0.841 | 0.367 | -3.4 | 0.854 | 0.356 | -3.2 |
| Learn the words of an idiom or phrase together | 0.732 | 0.446 | 7.5 | 0.768 | 0.425 | 7.6 |
| Use physical action when learning words | 0.573 | 0.498 | -1.7 | 0.756 | 0.432 | -4.5 |
| Use verbal repetition | 0.976 | 0.155 | -4.3 | 0.915 | 0.281 | 4.1 |
| Use written repetition | 0.951 | 0.217 | -1.8 | 0.902 | 0.299 | -6.1 |
| Use word lists | 0.829 | 0.379 | 0.1 | 0.805 | 0.399 | 5.4 |
| Use flash cards | 0.415 | 0.496 | 1.5 | 0.695 | 0.463 | -9.5 |
| Take notes in class | 0.939 | 0.241 | 2.4 | 0.717 | 0.389 | 21.6 |
| Use the vocabulary section in your textbook | 0.744 | 0.439 | 18.2 | 0.829 | 0.379 | 7.5 |
| Listen to a recording of the word | 0.768 | 0.425 | 1.0 | 0.805 | 0.399 | 3.9 |
| Put English labels on physical objects | 0.232 | 0.425 | 1.2 | 0.659 | 0.477 | -5.9 |
| Keep a vocabulary notebook | 0.841 | 0.367 | 9.2 | 0.866 | 0.343 | 7.5 |
| Use English-language media | 0.768 | 0.425 | 7.6 | 0.780 | 0.416 | 13.1 |
| Test yourself with word tests | 0.732 | 0.446 | 8.3 | 0.805 | 0.399 | 9.1 |
| Use spaced word practice | 0.780 | 0.416 | 7.9 | 0.841 | 0.367 | 0.3 |
| Skip or pass the new word | 0.707 | 0.458 | -20.3 | 0.805 | 0.399 | -51.6 |
| Continue to study the word over time | 0.902 | 0.299 | -2.1 | 0.841 | 0.367 | 6.3 |
| Use a smartphone language learning app | 0.732 | 0.446 | -4.3 | 0.829 | 0.379 | -3.6 |
| Use an online language learning program | 0.634 | 0.485 | -1.2 | 0.780 | 0.416 | 1.3 |
| Use an AI Bot | 0.561 | 0.499 | N/A | 0.561 | 0.807 | N/A |
| Use Chrome extension program of an online dictionary or translator | 0.378 | 0.488 | N/A | 0.415 | 0.788 | N/A |