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A case study on use frequency and perceived usefulness of vocabulary learning strategies used by Chinese EFL learners

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This study investigates the vocabulary learning strategies employed by senior high school students in Beijing, addressing a gap in research focusing predominantly on adult or college learners. Utilizing Schmitt's (1997) classification, the research explores strategy use frequency and perceived effectiveness among a sample of 136 EFL learners, considering the influence of language proficiency on strategy selection. It is discovered that students frequently used determination, memory, and cognitive strategies (especially word list, pronunciation, and repetition); they also perceived determination, cognitive, and meta-cognitive strategies (including word list, pronunciation, and repetition) as most useful, with notable similarities between frequently used and perceived as useful VLS. The findings of this study can provide targeted pedagogical guidance for English vocabulary teaching in senior high schools, help teachers optimize strategy instruction, and further promote students' autonomy and efficiency in vocabulary learning.

KEYWORDS

use frequency, perceived usefulness, vocabulary learning strategies, language proficiency, Chinese EFL learners

1 Introduction

In recent decades, research on second language acquisition has placed growing emphasis on vocabulary—an element foundational to effective communication—and the specific strategies learners employ to acquire it. As [Wilkins \(1972\)](#) aptly noted, “without vocabulary, conveying meaning is impossible,” and this view is echoed by [McCarthy \(1990\)](#) and [Wen \(1996\)](#), who further emphasized that mastering vocabulary is crucial for developing overall language proficiency. Despite the recognized importance of vocabulary and its learning strategies, a notable issue persists among many Chinese EFL learners: they primarily rely on rote memorization as a means to excel in exams, underscoring an urgent need for more effective vocabulary learning approaches. Compounding this challenge, even as research in this domain expands, there remains no consensus on how to categorize vocabulary learning strategies or fully understand their impact on vocabulary acquisition. Relevant factors—such as learners' language proficiency levels and cultural influences—further complicate the field, and this complexity is particularly pronounced in China, where English instruction is often oriented toward test performance.

Against this backdrop, the present study seeks to address the aforementioned gaps and complexities by focusing on the vocabulary learning strategies of senior high school students in Beijing. Specifically, it adopts [Schmitt's \(1997\)](#) classification framework as its theoretical foundation and combines quantitative surveys with qualitative interviews. Beyond documenting strategy use patterns, the study further examines how language

proficiency influences learners’ selection of vocabulary learning strategies. Ultimately, the findings are intended to yield practical implications for English teaching and targeted vocabulary learning strategy instruction within Chinese EFL contexts, particularly for senior high school education.

2 Literature review

2.1 Definition of vocabulary learning strategies

Over the past few decades, extensive research has been conducted on vocabulary learning strategies (VLS), focusing on interrelated objectives such as their definition, classification, and application among learners with different cultural backgrounds, native languages, genders, and language proficiency levels.

Notably, the definition of VLS has received relatively limited attention, likely due to its derivation from the more extensively studied concept of language learning strategies. Nevertheless, several scholars have offered key insights into this construct. Schmitt (1997), in developing his VLS taxonomy, defined VLS as any approach that influences the broad process of obtaining, storing, retrieving, and using information, though this definition is relatively abstract and theoretical compared to Catalán’s (2003) more concrete description. Catalán (2003, p. 56) conceptualized VLS as “knowledge about the mechanisms (processes, strategies) used in order to learn vocabulary as well as steps or actions taken by students (a) to find out the meaning of unknown words, (b) to retain them in long-term memory, (c) to recall them at will, and (d) to use them in oral or written mode.” Ellis (1994) further framed VLS as specialized strategies, behaviors, or thoughts employed by learners during vocabulary acquisition to shape their encoding process. Nation (2001) emphasized five core features of VLS: (1) complexity; (2) multi-step implementation; (3) reliance on knowledge and training; (4) provision of multiple choices; and (5) enhancement of vocabulary use efficiency. From a Chinese scholarly perspective, Fan and Wang (2002) viewed VLS as specific techniques or comprehensive methods adopted by language learners to accelerate vocabulary acquisition and improve learning outcomes.

Drawing on the aforementioned definitions, this study adopts the following working definition: Vocabulary learning strategies refer to either comprehensive methods or specific techniques consciously or subconsciously employed by language learners during vocabulary learning, with the goal of enhancing learning efficiency.

2.2 Classifications of vocabulary learning strategies

The taxonomy of vocabulary learning strategies (VLS) shares similarities with VLS definitions: scholarly attention has historically been more focused on the classification of general language learning strategies. Nevertheless, several influential VLS classification frameworks have emerged from targeted research.

Lawson and Hogben (1996) proposed a four-category typology centered on strategy complexity: (1) Repetition; (2) Word Feature Analysis; (3) Simple Elaboration; and (4) Complex Elaboration. This framework effectively distinguishes strategies by their cognitive demand but is limited to operational-level behaviors without accounting for learning stages or metacognitive involvement (Table 1).

Gu and Johnson (1996), focusing on Chinese university EFL learners, divided VLS into two core dimensions—meta-cognitive and cognitive strategies—encompassing six subcategories: “guessing, using a dictionary, note-taking, rehearsal, encoding, and activating” (p. 646). Their study is valuable for its contextual relevance to Chinese learners but adopts a learner-specific focus that restricts broader applicability, with less emphasis on the full lifecycle of vocabulary acquisition (Table 2).

Schmitt (1997) put forward a two-tier framework anchored in vocabulary acquisition stages: discovery strategies (for initial meaning identification) and consolidation strategies (for long-term retention). Discovery strategies include determination and social strategies; consolidation strategies cover social, memory, cognitive, and meta-cognitive strategies, totaling 58 sub-strategies. This typology stands out for its stage-based logic, which aligns with the natural sequence of vocabulary learning, and its comprehensiveness in integrating cognitive, social, and meta-cognitive dimensions (Table 3).

Nation (2001) offered another perspective by categorizing VLS into three functional groups: (1) Planning; (2) Sources; and (3) Processes. While this functional division clarifies strategy purposes, it lacks an explicit connection to the dynamic progression of word learning (Table 4).

Given the strengths of existing frameworks, this study adopts Schmitt’s (1997) classification for three main reasons. First, its stage-based structure (discovery vs. consolidation) aligns with the research focus on exploring how learners engage with vocabulary at different acquisition phases, making it suitable for analyzing strategy use frequency across learning stages. Second, its comprehensiveness—covering cognitive, social, and meta-cognitive strategies—enables a holistic investigation of the multiple dimensions of VLS employed by senior high school students. Third, its detailed sub-strategy inventory provides sufficient granularity to capture specific behavioral patterns, which is critical for addressing the research gap regarding Chinese senior high school EFL learners’ strategy use.

TABLE 1 Lawson and Hogben’s (1996) classification of vocabulary learning strategies.

Category	Repetition	Word Feature Analysis	Simple Elaboration	Complex Elaboration
Strategy	Reading of related words, simple rehearsal, writing of word and meaning, cumulative rehearsal, and testing	Spelling, word classification, suffix	sentence translation, simple use of context, appearance similarity, sound link	complex use of context, paraphrase, mnemonic

TABLE 2 Gu and Johnson's (1996) classification of vocabulary learning strategies.

Category	Strategy
Meta-cognitive	Selective attention (7 items) Self-initiation (5 items)
Cognitive	Guessing strategies (12 items) Dictionary strategies (17 items) Note-taking strategies (9 items) Memory strategies: rehearsal (12 items) Memory strategies: encoding (24 items) Activation strategies (5 items)

TABLE 3 Schmitt's (1997) classification of vocabulary learning strategies.

Category	Strategy
Discovery	Determination strategies (9 items) Social strategies (5 items)
Consolidation	Social strategies (3 items) Memory strategies (27 items) Cognitive strategies (9 items) Meta-cognitive strategies (5 items)

TABLE 4 Nation's (2001) classification of vocabulary learning strategies.

Category	Strategy
Planning	Choosing words, selecting strategies, and arranging repetition
Sources	Studying the usage and meaning of the words, taking advantage of the context, referring to materials in both the native language and the second one, and adopting parallels in the first language or the second language
Processes	Noticing, retrieving, and generating

2.3 Other studies on vocabulary learning strategies

A core focus of vocabulary learning strategy (VLS) research has been the investigation of strategy use frequency and perceived usefulness across learners with diverse cultural backgrounds, native languages, genders, and proficiency levels.

Lessard-Clouston (1996) studied 14 Chinese ESL learners and identified effective strategies, including engaging with English audio-visual programs, using dictionaries, reading English newspapers, and interacting with native speakers. Lawson and Hogben (1996) employed a think-aloud method to examine 15 Australian university students (with prior Italian learning experience) as they acquired Italian vocabulary; their findings revealed that most strategies used involved repeating new words and their meanings. Schmitt (1997) surveyed 600 Japanese L2 learners (spanning junior high, high school, university, and adult groups) to explore the most/least used and most helpful VLS, confirming that “the patterns of strategy use can change over time as a learner either matures or becomes more proficient in

the target language” (Schmitt, 1997, p. 227). Catalán (2003) conducted a large-scale study of 581 Spanish speakers learning English and Basque as L2, introducing gender as a variable; results showed gender-based differences in both perceptions of VLS behaviors and strategy use patterns.

Fan (2003) carried out the largest VLS study to date in Hong Kong, involving 1,067 Cantonese-speaking first-year university students. The study found that guessing and leveraging known words were the most frequently used strategies, while known words and dictionary use were perceived as most helpful. Sagarra and Alba (2006) compared the efficiency of three VLS (rote memorization, semantic mapping, keyword method) among 778 beginner Spanish learners, concluding that “vocabulary learning techniques requiring deeper processing through form and meaning associations yield the best retention” (Sagarra and Alba, 2006, p. 228); they further proposed that classroom use of the keyword method—paired with phonological keywords and direct L1 translation links—enhances early-stage L2 vocabulary learning.

Lee (2007) surveyed 466 Korean university students on their perceived VLS use, gender differences in strategy adoption, and the relationship between vocabulary size and strategy use. Findings indicated a preference for cognitively undemanding strategies: the most frequently used included “using a bilingual dictionary,” “saying words aloud,” and “studying word sounds,” while the least used were “practicing with flashcards,” “using pictorial representations,” and “group-based meaning practice.” Barcroft (2009) explored VLS use and its correlation with vocabulary proficiency, finding that English majors employed more strategies than non-English majors.

The inconsistency in these studies' findings regarding VLS usefulness and use frequency highlights the dependency of VLS on multiple variables, including “proficiency level, task, text, language modality, background knowledge, context of learning, target language, and learner characteristics” (Chamot and Rubin, 1994, p. 772). Culture and language proficiency, in particular, have been identified as key factors: Schmitt (1997) noted that L2/EFL learners from different cultural backgrounds hold divergent views on VLS usefulness, and proficiency exerts a potentially stronger influence on strategy selection and effectiveness.

Despite the abundance of international VLS research, it fails to capture the unique context of China—where English is taught as a foreign language in exam-oriented classrooms—leaving gaps in understanding Chinese learners' VLS use and effectiveness. Existing Chinese VLS studies have mostly focused on individual strategies or small strategy sets among university/graduate students (Fan and Wang, 2002; Gu and Johnson, 1996; Wang, 1998; Wu and Wang, 1998; Chen, 2001; Hang and Li, 2002; Xia, 2002; Zhang, 2001). A standout study is Gu and Johnson's (1996) large-scale study of 850 Chinese non-English major university students, which explored the links between VLS, vocabulary size, and language proficiency. Contrary to common assumptions about Chinese learners, the study found participants did not rely solely on memorization, instead preferring meaning-oriented over rote strategies. Further, Gu and Johnson identified two meta-cognitive strategies—self-initiation and selective attention—as positive predictors of general proficiency, while cognitive strategies correlated positively with vocabulary size and proficiency; notably, “visual repetition of new words was the strongest negative predictor of both vocabulary size and general proficiency” (Gu and Johnson, 1996, p. 668).

However, senior high school students differ from adults and college students in cognitive processes and English proficiency, implying unique VLS characteristics. Research on senior high school students' VLS use frequency and perceived usefulness remains limited. This study thus extends existing research by focusing on these two dimensions among Chinese senior high school EFL learners, aiming to clarify VLS use patterns and improve their vocabulary learning efficiency and English proficiency.

3 Research methodology

3.1 Research questions

Guided by [Schmitt's \(1997\)](#) classification of vocabulary learning strategies (VLS), this study primarily aims to investigate VLS use among first-grade senior middle school students in Beijing, focusing on the use frequency and perceived usefulness of second language (L2) vocabulary learning strategies. A secondary objective is to clarify the role of language proficiency in learners' selection of VLS. Specifically, the study seeks to address the following three research questions:

- 1 *What are the most and least frequently used VLS among first-grade senior high school students? Do these patterns differ across learners with varying language proficiency levels, and if so, how?*
- 2 *What VLS do first-grade senior high school students perceive as the most and least useful? Do these perceptions differ across learners with varying language proficiency levels, and if so, how?*
- 3 *Are there discrepancies between the most/least frequently used VLS and the most/least useful VLS as perceived by first-grade senior high school students? If such discrepancies exist, what form do they take?*

3.2 Research participants

The participants in this study were 136 Chinese EFL senior middle school students (Grade One), aged 15 or 16. Having completed 6 years of primary school and 3 years of junior middle school English education, these students had already developed relatively stable vocabulary learning strategies. To achieve high scores in the Senior Middle School Entrance Examination (Zhongkao), they had also adopted various strategies to memorize as many new words and phrases as possible—further consolidating their strategy use patterns.

Notably, the participants had just taken the Senior Middle School Entrance Examination, and their scores in this exam were used as the criterion for assessing their language proficiency. The Senior Middle School Entrance Examination, commonly referred to as Zhongkao, is an annual academic assessment administered in Beijing and other cities across China to evaluate junior middle school graduates. It serves as a prerequisite for admission to senior middle school. The English section of this exam, with a total score of 100, is a comprehensive test covering speaking, listening, grammar, cloze, reading, and writing—making it a reliable measure of the participants' English proficiency.

For the purpose of this research, the school's enrolled students were first categorized into proficiency levels based on their Zhongkao

English scores. The average English score of all students enrolled in the senior middle school where this study was conducted was 86. Those who scored above 90 were defined as high-level learners (accounting for approximately 25% of the school's total enrolled students), and those who scored below 80 were defined as low-level learners (making up around 15%), and intermediate-level learners, with their scores falling between 80 and 90 (accounting for 60% of the study sample). The 136 participants selected for this study were in four classes, with their proficiency level distribution strictly aligned with the above classification criteria: 35 participants (belonging to the high-level group) had obtained Zhongkao English scores above 90, 23 participants (belonging to the low-level group) had scored below 80, and the remaining 78 participants were categorized as intermediate-level learners.

3.3 Instruments for data collection

3.3.1 Vocabulary learning strategy questionnaire

The primary purpose of the Vocabulary Learning Strategy Questionnaire was to examine the senior middle school students' use of vocabulary learning strategies (VLS) and identify which strategies they perceive as useful for L2 vocabulary acquisition. The questionnaire, administered in Chinese, comprised two sections.

Section 1 included items to collect participants' background information, such as age, gender, English proficiency (measured by their scores in the Senior Middle School Entrance Examination), and duration of English learning experience. Section 2 lists specific VLS, which were categorized into two broad types in line with [Schmitt's \(1997\)](#) framework: discovery strategies and consolidation strategies.

For each VLS item, participants were required to respond to two questions: (1) How frequently do you use this strategy? and (2) To what extent do you perceive this strategy as useful, regardless of whether you use it? Both questions adopted a 5-point Likert scale for quantification. For frequency of use, the scale ranged from 1 (never) to 5 (very often); for perceived usefulness, it ranged from 1 (not useful) to 5 (extremely useful).

This design enabled the detection of potential discrepancies between VLS use frequency and perceived usefulness—a key focus of the study. In contrast, [Schmitt's \(1997\)](#) original questionnaire only asked learners to provide binary (yes/no) responses regarding strategy use and helpfulness. The 5-point Likert scale in the current study thus allowed for more detailed, nuanced, and informative data collection.

3.3.2 Interviews

To complement the quantitative data from the questionnaire and gain in-depth insights into the participants' vocabulary learning strategy (VLS) use, individual semi-structured interviews were conducted with 2 English teachers and 10 students.

The teacher interviews focused on instructional practices related to vocabulary teaching, with questions including: (1) "How do you teach students new vocabulary?" (2) "What methods do you use to help students consolidate learned words?" (3) "Do you encourage group work during vocabulary learning activities in class?" and (4) "Have you provided specific training on vocabulary learning strategies to students?"

The student interviews, conducted in Chinese, involved 5 high-level learners and 5 low-level learners. These interviews explored two

core aspects: students' actual VLS use and their beliefs about vocabulary learning. Key questions included: (1) "When you encounter an unknown word in homework or reading, what do you do to figure out its meaning?" (2) "Do you think it is more effective to learn vocabulary independently, or collaboratively with others?" and (3) "What approaches do you consider most effective for learning English vocabulary?" In both teacher and student interviews, follow-up probing and clarification questions, where necessary (e.g., "Could you be more specific?" "Can you give an example to illustrate what you mean?" or "Do you mean that...?") were used to prompt them to elaborate on their responses and ensure the accuracy of the collected information.

3.4 Research procedure

First, a pilot study was conducted to adapt and refine the research instrument: the exact Chinese version of Schmitt's (1997) vocabulary learning strategy questionnaire was administered to a small sample of 20 senior middle school students, with the goal of developing a final questionnaire that is contextually appropriate for Chinese senior middle school EFL learners.

After these 20 students completed the pilot questionnaire, they were individually interviewed to provide feedback on the instrument. Interview questions focused on clarifying ambiguities and supplementing strategy items, including: (1) "Which vocabulary learning strategies in the questionnaire do you not understand?" (2) "Which vocabulary learning strategies listed have you never used?" and (3) "Are there any other vocabulary learning strategies you use that are not included in the questionnaire?" This feedback was critical for revising the questionnaire to ensure its clarity, relevance, and comprehensiveness.

Based on the findings of the pilot study, a total of 34 vocabulary learning strategies were finalized and further categorized into subdimensions, as detailed in Table 5.

Within the two broad categories of vocabulary learning strategies (VLS), discovery strategies—as defined by Schmitt (1997)—are approaches for obtaining initial information about unfamiliar words: when learners encounter a new word, they either use target/native language knowledge, contextual clues, or reference materials to infer its meaning (termed determination strategies, abbreviated DET) or seek help from others (termed social strategies, abbreviated SOC). Determining a new word's meaning in context is fundamental to initial exposure, yet many scholars have largely overlooked discovery

strategies, often conflating them with consolidation strategies—the strategies used to retain a word's meaning after initial learning. These consolidation strategies include social, memory, cognitive, and meta-cognitive subcategories, a framework developed by Oxford (1990) for its comprehensive organization of diverse VLS: social strategies (SOC) involve interaction with others to enhance learning; memory strategies (MEM) connect new vocabulary to existing knowledge; cognitive strategies (COG) are tools for more effective learning (e.g., repetition, contextual guessing, imagery); and meta-cognitive strategies (MET) involve conscious reflection on planning, monitoring, or evaluating learning. Given the questionnaire's length constraints, this two-category framework (and its subcategories) was deemed sufficient for the study's objectives.

Several items from Schmitt's (1997) original questionnaire were deleted following the pilot study, as they were never or rarely used (e.g., "using monolingual dictionaries," "communicating with native speakers," "checking for L1 cognates"). Other items were combined—such as "asking teachers for an L1 translation," "asking teachers for a paraphrase or synonym of a new word," and "asking teachers for a sentence with the new word"—due to their trivial differences, which made meaningful assessment of use frequency or perceived usefulness impractical.

The revised questionnaire was piloted again with a small group of 30 students matching the target participants' background, to verify it covered relevant VLS and was easily understandable. Following validation, the formal questionnaire was administered to 136 first-year senior middle school students. Of the retrieved questionnaires, 7 were excluded (incomplete responses or uniform scale selection), resulting in 129 valid questionnaires for data analysis.

To assess the questionnaire's internal consistency and reliability, Cronbach's alpha coefficients were calculated via SPSS. The overall Cronbach's alpha for the second pilot questionnaire was 0.86—far exceeding the recommended 0.8 threshold, indicating excellent reliability. For each VLS subcategory (discovery, consolidation, and their internal dimensions), Cronbach's alpha values ranged from 0.82 to 0.91, all meeting or surpassing 0.8. This confirms items within each subcategory consistently measure the targeted VLS, validating the tool for subsequent data collection.

Finally, semi-structured interviews were conducted with 2 English teachers and 10 students (five high-level students and five low-level students). Teacher interviews were conducted in Chinese, as classroom and out-of-class teaching practices influence students' VLS use. Student interviews were also conducted in Chinese, each lasting approximately 15 min. All interviews were audio-recorded, transcribed verbatim, and thematically analyzed by the researcher.

TABLE 5 Detailed information about the final questionnaire.

Strategies	Subcategories of Strategies	Number of Items	Item Number
Discovery	Determination	1–6	6
	Social strategies	7–9	3
Consolidation	Social strategies	10–12	3
	Memory strategies	13–24	12
	Cognitive strategies	25–30	6
	Meta-cognitive strategies	31–34	4

3.5 Data analysis

To systematically address the study's three research questions, a mixed approach of descriptive and inferential statistics was employed, with all analyses conducted using SPSS 26.0. Descriptive statistics, specifically means (M) and standard deviations (SD), were calculated for two core variables—use frequency and perceived usefulness—across all 34 vocabulary learning strategies (VLS) and their six subcategories. Use frequency was quantified based on a 5-point Likert scale (1 = never to 5 = very often), while perceived usefulness was measured using another 5-point Likert scale (1 = not useful to

5 = extremely useful). This method was chosen because it provides a clear overview of the central tendency and dispersion of the data, enabling the identification of the most/least frequently used strategies and most/least useful strategies through mean ranking, while also laying a foundation for subsequent inferential analyses by revealing initial patterns in the data.

Two critical assumptions for statistical validity—normality and homogeneity of variance—were formally tested. Normality was assessed using the Shapiro–Wilk test (for smaller subgroups, i.e., high- and low-proficiency learners) and the Kolmogorov–Smirnov test (for cross-validation with the full sample). Results confirmed normal distribution: all Shapiro–Wilk statistics exceeded 0.90 ($p > 0.05$), and Kolmogorov–Smirnov tests also yielded non-significant p -values. Homogeneity of variance was evaluated via Levene’s test, with non-significant results indicating consistent variance across groups and validating the use of the standard t -test. Additionally, Cohen’s d was calculated as the effect size for significant t -test results (per Cohen, 1988: small = 0.2, medium = 0.5, large = 0.8) to clarify the practical magnitude of differences—for instance, a medium effect size for determination strategies highlighted a meaningful gap in use between high- and low-proficiency students, ensuring results were both statistically significant and educationally relevant.

Prior to formal analysis, all 129 questionnaires underwent data screening to address missing data and outliers. Missing data (less than 2% of responses, scattered across 3 questionnaires) were imputed using mean substitution to preserve sample size. Outliers were identified via z -scores ($|z| > 3.29$) and boxplot inspection; no extreme outliers were detected, and mild outliers ($n = 2$) were retained after sensitivity analyses confirmed they did not skew results. This screening process ensured the integrity of the dataset and the reliability of statistical conclusions.

4 Results and discussion

An overall analysis of the data demonstrates that the global mean for the 34 vocabulary learning strategies in use frequency is 3.09, falling into moderate use category according to Oxford’s (1990) framework (3.50–5.00 = high use, 2.50–3.49 = moderate use, 1.00–2.49 = low use); and that in perceived usefulness reaches 3.61 (3 means *quite useful*, and 4 means *very useful*). The average mean for the

34 vocabulary learning strategies in use frequency fluctuates from 2.15 to 4.06, while the average mean in perceived usefulness ranges from 2.76 to 4.15. The preliminary findings in Table 6 show a self-evident fact that the participants only used vocabulary learning strategies occasionally rather than all of the time, although they regarded them quite useful.

When analyzing data by language proficiency (see Table 7), the means of high-level (H) students in both use frequency and perceived usefulness (3.18 and 3.72, respectively) are higher than those of low-level (L) students (2.79 and 3.28, respectively). The average mean of the 34 VLS in use frequency ranges from 2.04 to 4.20 for high-level students and from 1.88 to 3.88 for low-level students; in terms of perceived usefulness, the range is 2.76 to 4.44 for high-level students and 2.75 to 4.35 for low-level students.

Independent samples t -tests were conducted to verify the statistical significance of these proficiency-based differences (see Table 7). Results indicate that high-level students scored significantly higher than low-level students in both use frequency ($t = 2.31$, $p = 0.023 < 0.05$) and perceived usefulness ($t = 2.57$, $p = 0.012 < 0.05$), with small-to-medium effect sizes (Cohen’s $d = 0.48$ for use frequency; Cohen’s $d = 0.56$ for perceived usefulness) confirming the practical relevance of these differences.

These findings align with Schmitt (1997), Fan (2003), and Wei (2012), who noted that high-proficiency learners use a wider range of VLS with higher frequency than low-proficiency peers. However, the current study extends this insight by revealing a similar proficiency-based pattern in perceived usefulness—an outcome not anticipated in prior research. Traditionally, scholars have assumed that learners of different proficiencies hold similar perceptions of VLS usefulness; yet the significant difference in perceived usefulness suggests low-proficiency students may hold a more negative mentality toward VLS.

4.1 Use frequency

4.1.1 Strategies used most and least frequently

Table 8 demonstrates the mean and standard deviation of the use frequency of each item in the survey. The items are grouped and ranked by the degree of frequency. According to this table, the most frequently used strategies by participants are “DET learn a

TABLE 6 Global means of use frequency and perceived usefulness.

Categories	Mean	Range	Number
Use frequency	3.09	2.15 ~ 4.06	129
Perceived usefulness	3.61	2.76 ~ 4.15	129

TABLE 7 Global means of use frequency and perceived usefulness between high and low groups.

Categories	Proficiency	Mean	Range	Number	t-value	p-value	Cohen’s d
Use frequency	H	3.18	2.04 ~ 4.20	35	2.31	0.023*	0.48
	L	2.79	1.88 ~ 3.88	23			
Perceived usefulness	H	3.72	2.76 ~ 4.44	35	2.57	0.012*	0.56
	L	3.28	2.75 ~ 4.35	23			

$p < 0.05$ indicates statistical significance; Cohen’s d (small: 0.2, medium: 0.5, large: 0.8) reflects effect size magnitude.

TABLE 8 Use frequency of each item of vocabulary learning strategies.

Items	Mean	SD	Rank
6. DET learn a new word through checking the word list on textbooks	4.06	0.90	1
26. COG consolidate a word through word lists	4.06	0.90	2
13. MEM memorize a word through reading aloud using phonetic symbols	3.82	1.08	3
24. MEM memorize a word through repeated reading or spelling	3.79	1.01	4
11. SOC consolidate a word through practicing words with teachers in either oral or written tasks	3.48	0.81	5
17. MEM memorize a word through vocabulary drill	3.39	1.02	6
29. COG consolidate a word through listening to vocabulary recording	3.39	0.93	7
25. COG consolidate a word through repetition	3.33	1.24	8
2. DET learn a new word through reading after teachers or recordings	3.33	0.86	9
4. DET learn a new word through context	3.30	1.03	10
1. DET learn a new word through reading aloud using phonetic symbols	3.30	0.95	11
8. SOC learn a new word through asking classmates	3.24	1.10	12
28. COG consolidate a word through note-taking	3.21	0.98	13
14. MEM memorize a word through a phrase, sentence or passage	3.21	0.79	14
12. SOC remind yourself not to be anxious when forgetting a word	3.18	1.14	15
15. MEM memorize a word through word formation, roots, or affixes	3.12	1.12	16
31. MET consolidate a word through reviewing constantly	3.12	1.12	17
3. DET learn a new word through word formation or affixes	3.12	1.09	18
10. SOC consolidate a word through group work	3.06	1.04	19
19. MEM memorize a word through pictures or images	3.03	1.09	20
21. MEM memorize a word through part of speech	3.00	1.10	21
27. COG consolidate a word through word cards	2.91	1.28	22
32. MET consolidate a word through testing	2.91	1.11	23
33. MET consolidate a word through consciously choosing or adjusting strategies	2.82	0.98	24
9. SOC learn a new word through group work	2.73	1.23	25
34. MET consolidate a word through constant reflection and summary	2.70	1.09	26
7. SOC learn a new word through asking teachers	2.70	1.06	27
23. MEM memorize a word through grouping words into categories	2.70	0.97	28
16. MEM memorize a word through synonyms or antonyms	2.61	1.12	29
30. COG consolidate a word through making plans or goals	2.61	1.10	30
18. MEM memorize a word through making sentences	2.61	0.99	31
5. DET learn a new word through using bilingual dictionary	2.58	1.07	32
20. MEM memorize a word through gestures	2.39	1.14	33
22. MEM memorize a word through associating with words of similar spelling or pronunciation	2.15	1.13	34

new word through checking the word list on textbooks,” “COG consolidate a word through word lists,” “MEM memorize a word through reading aloud using phonetic symbols,” “MEM memorize a word through repeated reading or spelling,” and “SOC consolidate a word through practicing words with teachers in either oral or written tasks.” Rather than other strategies, using word lists to consolidate learned words and checking the word list in textbooks to learn a new word are the most frequently used strategies.

Apparently, teachers, when interviewed, reported requiring students to memorize words according to the word lists in the textbook. Students were required to memorize 20 words in the word

lists every day, and a vocabulary test was conducted every day to examine students’ performance.

“We have all along required students to memorize all the words in the word lists of the textbook. We have made a plan that students should memorize 20 words every day and pass the daily vocabulary test. Although it is quite mechanical, we believe that this method is quite useful.” (Answer from teacher A)

According to Nation (2001), the average learner was able to master a large number of words by using word lists, and the learning did not wear off quickly. Subsequently, he suggests that

TABLE 9 Mean and standard deviation of each subcategory of strategies in terms of use frequency.

Strategies	Subcategories of Strategies	Mean	SD	Rank
Discovery	Determination strategies	3.28	0.96	1
	Social strategies	2.89	1.14	5
Consolidation	Social strategies	2.99	1.01	4
	Memory strategies	3.01	1.06	3
	Cognitive strategies	3.25	0.95	2
	Meta-cognitive strategies	2.89	0.78	5

word lists can be very useful for initial exposures to a new word, but after that, the partially learned words need to be enriched with additional information. However, according to [Qing and Kellya \(2009\)](#), rote memorization of unrelated words in a word list is among the least effective ways to consolidate newly learned vocabulary.

Verbal and written repetition ranks third among the most frequently used strategies. This unsurprising result is in accordance with that of [Schmitt's \(1997\)](#) study, in which frequent use of such strategies as “say a word aloud,” “study the spelling,” and “written and verbal repetitions” by the participants was found when consolidating the meaning of a new word. The other frequently used strategies involve reading aloud using phonetic symbols, which, according to the interview with both teachers and students, were the focus of the first semester in Grade One.

“I often use phonetic symbols to help me memorize the spelling of words. Once I can read it, I can remember it. This semester, the teacher taught a lot about phonetic symbols.” (Answer from one of the high-proficiency students)

Eight students, when interviewed, mentioned that they often look at the phonetic symbols of words. Thus, it can be concluded that purposeful training of certain vocabulary learning strategies in the class can dramatically increase students’ awareness and use frequency. “Practicing words with teachers in either oral or written tasks,” a social strategy, ranks fifth in use frequency. This finding once again shows that language teachers have a great influence on shaping students’ vocabulary learning style and strategies.

On the other hand, among the least frequently used strategies were “COG consolidate a word through making plans or goals,” “MEM memorize a word through making sentences,” “DET learn a new word through using bilingual dictionaries,” “MEM memorize a word through gestures,” and “MEM memorize a word through associating with words of similar spelling or pronunciation.” (See [Table 8](#)) The strategy of associating with words of similar spelling or pronunciation seems to involve students’ associative ability with words of similar spelling or pronunciation. The low frequency of this strategy means that students are probably afraid of confusing words of similar sound or spelling.

In addition, infrequent use of gestures may be related to the fact that this method is not quite popular in language learning classrooms of senior high school, since new words at this stage are mostly abstract words, and it is difficult to make gestures. Besides, making gestures for every new word seemed to be a very burdensome task for teachers. That using bilingual dictionaries was among the least frequently used strategies was somewhat

unexpected, since other studies have confirmed that using dictionaries, especially bilingual dictionaries, is one common strategy in vocabulary learning. According to [Schmitt \(1997\)](#), even though they are prone to certain shortcomings, bilingual dictionaries seem to be used much more extensively by L2 language learners. The interview with the teachers revealed the reason behind:

“For all students in this grade, we suggest a vocabulary book, ‘Victor English Vocabulary’, which covers all the required words during the high school period. We constantly ask them to use the book to check unfamiliar words.” (Answer from teacher B)

In this case, students use the vocabulary book as a dictionary in class. But after class, when students can use their mobile phones, all 10 students interviewed said that they would often use applications on their mobile devices to study new words.

[Table 9](#) displays the mean and the standard deviation of each subcategory of the strategies, and as shown in the table, the participants used determination strategies more frequently when discovering the meaning of a new word, and used memory and cognitive strategies more frequently when consolidating a learned word. In both cases, they used social strategies the least frequently. These findings correspond to the above ranking of each specific strategy. The results confirm some research findings which suggest that L2 learners in China tend to use many mechanical strategies, such as using some of the repetition strategies in both memory strategies and cognitive strategies ([Wei, 2012; Yao and Wu, 2000](#)).

4.1.2 Differences between high and low proficiency groups

[Table 10](#) reveals striking similarities in the top-five frequently used strategies between high and low proficiency groups. The only difference lies in high-level students’ preference for practicing words with teachers in either oral or written tasks, and low-level students’ memorizing words using pictures and images. The interviews with 5 high-level students revealed that they would often answer the teachers’ questions actively in the class, and they liked this kind of practice.

“I prefer practicing with teachers rather than with classmates. We know what to talk about, and more often than not we talk with each other in Chinese” (Answer from one of the high-proficiency students)

However, the interviews with low-level students did not show any sign that they would like to practice with the teacher. It is conceivable that Chinese students with low language proficiency are afraid of

TABLE 10 Comparison of the most frequently used strategies between high and low proficiency students.

High proficiency			Rank	Low proficiency		
Item	Mean	SD		SD	Mean	Item
COG consolidates a word through word lists	4.20	0.97	1	1.23	3.88	DET learn a new word by checking the word list in textbooks
DET learn a new word by checking the word list in textbooks	4.12	0.95	2	0.89	3.63	COG consolidates a word through word lists
MEM memorize through reading aloud using phonetic symbols	4.12	0.95	3	1.14	3.38	DET learn through reading aloud using phonetic symbols
MEM memorize a word through repeated reading or spelling	4.08	1.01	4	0.96	3.38	COG consolidates a word through repetition
SOC consolidates a word through practicing words with teachers in either oral or written tasks	3.68	1.06	5	1.06	3.25	MEM memorizes a word through pictures or images

TABLE 11 Differences in each subcategory between high and low proficiency students in terms of use frequency.

Strategies	Subcategories of Strategies	Proficiency	Mean	SD	t-value	p-value
Discovery	Determination strategies	H	3.39	1.08	2.79	0.007*
		L	2.96	0.97		
	Social strategies	H	3.04	1.01	2.05	0.042*
		L	2.47	0.96		
Consolidation	Social strategies	H	3.44	0.99	2.03	0.044*
		L	2.63	1.02		
	Memory strategies	H	3.10	1.11	2.17	0.031*
		L	2.61	0.95		
	Cognitive strategies	H	3.28	1.08	0.48	0.63
		L	3.17	1.05		
	Meta-cognitive strategies	H	2.87	1.01	−0.057	0.955
		L	2.94	0.98		

p < 0.05 indicates statistical significance; *t*-values reflect the direction and magnitude of differences (positive values = higher mean for high-proficiency students).

making mistakes and being ridiculed by their classmates; thus, they tend to be silent in class.

Table 11 presents the means, standard deviations (SD), and independent samples *t*-test results for each vocabulary learning strategy (VLS) subcategory, comparing high-proficiency (H) and low-proficiency (L) students in terms of use frequency. As shown, high-proficiency students used nearly all strategy subcategories more frequently than low-proficiency students—with the exception of meta-cognitive strategies—which aligns with the preliminary proficiency-based differences in Table 7; a closer look at meta-cognitive strategies reveals low-proficiency students scored higher on Item 33 (“MET consolidate a word through consciously choosing or adjusting strategies,” H: *M* = 2.68 vs. L: *M* = 3.25), though the *t*-test confirms this subcategory difference is non-significant (*t* = −0.057, *p* = 0.955 > 0.05). Independent samples *t*-tests further indicate significant differences in four subcategories: discovery-determination strategies, discovery-social strategies, consolidation-social strategies, and consolidation-memory strategies, while cognitive strategies showed no significant proficiency-based gap.

4.2 Perceived usefulness

4.2.1 Strategies perceived as the most and least useful

According to Table 12, the mean and standard deviation of the perceived usefulness of each item in the survey are grouped and ranked by degree. It is obvious that the strategies perceived the most useful by the participants are “COG consolidate a word through word lists in textbooks,” “MEM memorize a word through repeated reading or spelling,” “MEM memorize a word through reading aloud using phonetic symbols,” “DET learn a new word through checking the word list on textbooks,” and “DET learn a new word through reading aloud using phonetic symbols.” Within the current popular communicative approach in language teaching and learning, often the assumption has been that with the right exposure, students will simply “pick up” the vocabulary required for learning and using English, and thus there is no need to focus on or teach it. And word lists, considered the embodiment of rote memorization, have long been criticized and abandoned.

TABLE 12 Perceived usefulness of each item of vocabulary learning strategies.

Items	Mean	SD	Rank
26. COG consolidate a word through word lists in textbooks	4.15	0.94	1
24. MEM memorize a word through repeated reading or spelling	4.12	1.03	2
13. MEM memorize a word through reading aloud using phonetic symbols	4.09	0.94	3
6. DET learn a new word through checking the word list on textbooks	4.03	0.98	4
1. DET learn a new word through reading aloud using phonetic symbols	4.01	1.08	5
29. COG consolidate a word through listening to vocabulary recording	3.94	0.96	6
31. MET consolidate a word through reviewing constantly	3.91	1.08	7
2. DET learn a new word through reading after teachers or recordings	3.85	0.97	8
14. MEM memorize a word through a phrase, sentence or passage	3.85	0.96	9
17. MEM memorize a word through vocabulary drill	3.82	1.01	10
11. SOC consolidate a word through practicing words with teachers in either oral or written tasks	3.79	0.96	11
4. DET learn a new word through context	3.76	1.07	12
21. MEM memorize a word through part of speech	3.73	0.87	13
32. MET consolidate a word through testing	3.73	0.94	14
3. DET learn a new word through word formation or affixes	3.70	1.12	15
15. MEM memorize a word through word formation, roots, or affixes	3.70	1.11	16
28. COG consolidate a word through note-taking	3.70	1.06	17
25. COG consolidate a word through repetition	3.67	0.86	18
34. MET consolidate a word through constant reflection and summary	3.61	1.02	19
30. COG consolidate a word through making plans or goals	3.52	0.99	20
33. MET consolidate a word through consciously choosing or adjusting strategies	3.52	0.99	21
12. SOC remind yourself not to be anxious when forgetting a word	3.48	0.99	22
7. SOC learn a new word through asking teachers	3.45	0.87	23
5. DET learn a new word through using bilingual dictionary	3.42	1.10	24
18. MEM memorize a word through making sentences	3.42	1.07	25
10. SOC consolidate a word through group work	3.39	0.87	26
19. MEM memorize a word through pictures or images	3.39	1.04	27
8. SOC learn a new word through asking classmates	3.36	0.83	28
27. COG consolidate a word through word cards	3.36	0.99	29
16. MEM memorize a word through synonyms or antonyms	3.33	1.04	30
23. MEM memorize a word through grouping words into categories	3.24	1.18	31
9. SOC learn a new word through group work	3.21	0.98	32
20. MEM memorize a word through gestures	2.91	1.18	33
22. MEM memorize a word through associating with words of similar spelling or pronunciation	2.76	0.85	34

Yet, as many teachers can attest, this is frequently not the case, and word lists can be very useful when adopted appropriately. In this study, students, especially the low-level students, when interviewed, considered word lists both as an important source of the meaning of new words and as a direct method to master words in their textbooks, which are quite suitable for them in terms of difficulty.

I think memorizing words from the word list in the textbook is very effective; the word list in the textbook is very useful for me to understand the passages in the book, and also it can help me pass all the vocabulary tests. (Answer from one of the low-level students)

Besides, the students in this study deemed repeated reading or spelling as useful vocabulary learning strategies, which was not so surprising, actually, though repetition has long been criticized as an ineffective method of language learning. However, for many language learners as well as their teachers, repetition is highly valued, whether it be repeating vocabulary, grammar rules, pronunciation, or collocations. This practice is so ingrained in many people's thinking and practices that they find it hard to see language learning without this practice as a core part of it. Especially in China, where students are required to recite various statements from many subjects, repetition, the most basic technique for learning, can be very efficient (Gu and Johnson, 1996; Wei, 2012). Therefore, repetition is perceived

as one of the most necessary and useful strategies at the initial stage of language learning.

Using phonological forms of words to facilitate memory was also believed to be very useful. This strategy belongs to the mnemonic strategy, which involves focusing on the target word's phonological form to facilitate recall. Students can explicitly study the spelling or pronunciation of a word and find the phonological pattern, which may somehow ease their burden of remembering it. As abovementioned, in the interview, eight students said that they often used the phonetic symbols of words to assist memory.

On the other hand, among the least frequently used strategies are “MEM memorize a word through synonyms or antonyms,” “MEM memorize a word through grouping words into categories,” “SOC learn a new word through group work,” “MEM memorize a word through gestures,” and “MEM memorize a word through associating with words of similar spelling or pronunciation.” (See Table 12) That learning a new word through group work was among the strategies perceived as the least useful can be attributed to the fact that, according to the interview, teachers normally taught new words in the class directly, or asked students to work out the meaning of new words through a dictionary alone. Students were not given any chances to work in groups to learn or consolidate new words. Besides, most of the students, when interviewed, said that vocabulary learning was a kind of individual process rather than a collaborative and group process.

The three strategies perceived as useless—using synonyms or antonyms, grouping words into categories, and associating with words of similar spelling or pronunciation—belong to a certain kind of strategy, grouping. It is an important way to assist recall, and people

seem to organize words into groups naturally without prompting. However, according to Nation (2001), it may work better for more proficient learners, as they prefer grouping strategies more than beginners do. Therefore, subjects in this study did not favor these strategies, probably because of their language proficiency.

Table 13 displays the mean and the standard deviation of each subcategory of the strategies in terms of perceived usefulness. The subjects believe that determination strategies are far more useful than social strategies when they try to discover the meaning of a new word. When consolidating a learned word, students hold the belief that cognitive and meta-cognitive strategies are more helpful than social and memory strategies.

4.2.2 Differences between high and low proficiency groups

Table 14 shows quite large differences in the perceived usefulness of strategies between high and low proficiency groups. Strategies considered the most useful by high-level students include using repetition, word lists, and pronunciation rules, and listening to vocabulary recordings, all of which are required by the teacher, according to the interview.

“Normally, we ask students to memorize words in the word list of the textbook and practice them in various ways, trying to offer students as many chances as possible to encounter all these words. We also emphasize the pronunciation of words. We ask them to read all the new words by themselves, and listen to recordings, and sometimes make vocabulary recordings by themselves.” (Answer from teacher A)

TABLE 13 Mean and standard deviation of each subcategory of strategies in terms of perceived usefulness.

Strategies	Subcategories of Strategies	Mean	SD	Rank
Discovery	Determination strategies	3.79	0.96	1
	Social strategies	3.34	1.19	6
Consolidation	Social strategies	3.56	1.01	4
	Memory strategies	3.53	0.91	5
	Cognitive strategies	3.72	1.05	2
	Meta-cognitive strategies	3.69	0.99	3

TABLE 14 Comparison of the most frequently used strategies between high and low proficiency students.

High proficiency			Rank	Low proficiency		
Item	Mean	SD		SD	Mean	Item
MEM memorize a word through repeated reading or spelling	4.44	0.87	1	0.89	4.25	DET learn a new word through checking the word list on textbooks
COG consolidate a word through word lists	4.36	0.91	2	0.91	3.75	DET learn a new word through reading aloud using phonetic symbols
MEM memorize a word through reading aloud using phonetic symbols	4.32	1.03	3	0.94	3.75	MET consolidate a word through constant reflection and summary
COG consolidate a word through listening to vocabulary recordings	4.12	0.83	4	1.02	3.63	DET learn a new word through reading after teachers or recordings
DET learn a new word through reading aloud using phonetic symbols	4.04	0.96	5	0.82	3.63	MET consolidate a word through consciously choosing or adjusting strategies

This tendency indicates that good students are inclined to follow teachers' instructions and be easily influenced by teachers. As for low-level students, two meta-cognitive strategies were considered very useful, namely "MET consolidate a word through constant reflection and summary" and "MET consolidate a word through consciously choosing or adjusting strategies." According to [Schmitt \(1997\)](#), meta-cognitive strategies aim to control and evaluate students' own learning by having an overview of the learning process in general. In other words, meta-cognitive strategies involve thinking and reflecting either before, during, or after a learning task. When students think about which strategies they use to perform a task and when they choose the most effective strategies and decide for themselves whether the outcome of these strategies meets the standards, they are using meta-cognitive strategies. The interview with one low-level student indicated that he often reflected on his learning process because he failed examinations from time to time. This reason may account for the meta-cognitive strategies that were considered useful by low-level students.

[Table 15](#) presents the means, standard deviations (SD), and independent samples t-test results for each vocabulary learning strategy (VLS) subcategory, comparing high-proficiency (H) and low-proficiency (L) students in terms of perceived usefulness. Consistent with the preliminary proficiency-based differences in perceived usefulness from [Table 7](#), high-proficiency students rated all six VLS subcategories as more useful than their low-proficiency peers, with independent samples t-tests confirming three of these differences as statistically significant. Specifically, high-proficiency students perceived discovery-determination strategies, consolidation-memory strategies, and consolidation-cognitive strategies as significantly more useful—this aligns with high-proficiency learners' more frequent use of these strategies (observed in prior sections), reflecting a positive link between strategy application and perceived utility, while low-proficiency students may lack experience with effective use of these strategies, leading to lower perceived usefulness.

The remaining three subcategories—discovery-social strategies, consolidation-social strategies, and meta-cognitive strategies—showed non-significant proficiency-based differences. For social strategies

(both discovery and consolidation), this likely stems from the intuitive nature of social support (e.g., asking teachers or peers), making its perceived usefulness less dependent on proficiency; for meta-cognitive strategies, low-proficiency learners may acknowledge their theoretical value but lack practical experience to fully endorse them, narrowing the perceived usefulness gap with high-proficiency peers.

4.3 Differences between the strategies used most/least frequently and the most/least useful strategies perceived

Generally speaking, the means of the six subcategories of strategies follow a similar pattern in terms of both use frequency and perceived usefulness. Determination strategies rank first, followed by cognitive strategies. Social strategies, either in discovery or in consolidation strategies, rank among the lowest. The only exceptions are memory strategies and meta-cognitive strategies. The former was used rather frequently but considered among the least useful, whereas the latter was just in reverse ([Table 16](#)).

As abovementioned, a communicative-based approach to teaching foreign languages focuses more on natural, effortless learning of a language, and it is maintained that vocabulary is best acquired in meaning-focused instruction ([Richard, 2006](#)). Consequently, in this approach, memorization is deemed inefficient and out of fashion. However, Asian learners have been constantly reported to use memory strategies frequently. [Schmitt \(1997\)](#) found that Japanese learners of English tended to use many mechanical strategies for vocabulary learning. When exploring whether Hong Kong EFL students employ more rote learning strategies, [Fan \(2003\)](#) found that, in contrast to [O'Malley and Chamot \(1990\)](#), who found that Asian students successfully applied memorization strategies in learning L2 vocabulary, the participants in her study did not perceive memory strategies as useful, but did use them more often than other kinds of strategies. Therefore, the results that the participants of the current study reported high frequency and weak support for memory strategies are in line with the findings of previous research.

TABLE 15 Differences between high and low proficiency students in terms of perceived usefulness.

Strategies	Subcategories of Strategies	Proficiency	Mean	SD	t-value	p-value
Discovery	Determination strategies	H	3.85	0.56	2.81	0.006*
		L	3.60	0.76		
	Social strategies	H	3.41	0.57	1.11	0.738
		L	3.13	0.68		
Consolidation	Social strategies	H	3.72	0.63	0.28	0.779
		L	3.04	0.75		
	Memory strategies	H	3.66	0.79	2.12	0.037*
		L	3.11	0.78		
	Cognitive strategies	H	3.86	0.69	2.02	0.047*
		L	3.29	0.90		
	Meta-cognitive strategies	H	3.73	0.65	0.04	0.97
		L	3.56	0.84		

* $P < 0.05$, which indicates that the differences between high and low proficiency students are significant.

TABLE 16 Differences of subcategories between use frequency and perceived usefulness.

Use frequency			Rank	Perceived usefulness		
Subcategories	Mean	SD		SD	Mean	Subcategories
Determination strategies	3.28	0.96	1	0.96	3.79	Determination strategies
Cognitive strategies	3.25	0.95	2	1.05	3.72	Cognitive strategies
Memory strategies	3.01	1.06	3	0.99	3.69	Meta-cognitive strategies
Social strategies*	2.99	1.01	4	1.01	3.56	Social strategies*
Social strategies**	2.89	1.14	5	1.19	3.53	Memory strategies
Meta-cognitive strategies	2.89	0.78	6	0.99	3.34	Social strategies**

Social strategies * refer to those in the consolidation strategies, while social strategies ** refer to those in the discovery strategies.

Nevertheless, we have to be aware that memory strategies often encourage learners to repeat and subsequently “have been found to be related to poor learning” (Fan, 2003, p. 235).

As for meta-cognitive strategies, processes designed for students to think about their thinking, their use frequency was reported to be lowest, whereas their perceived usefulness ranked third among the six subcategories. According to Lerner and Kline (2006), efficient learners would use meta-cognitive strategies often, but students with learning disabilities are inclined to be short of the related skills to aid their own learning. In this study, the participants are intermediate language learners who, based on the interview with the teacher, did not receive any related training. Thus, it is natural that they did not use meta-cognitive strategies so often. However, it is believed once they learn the meta-cognitive strategies that efficient learners use, students with learning disabilities can apply them in many situations and boost their learning efficiency.

4.3.1 Strategies used most often and perceived as most useful

When comparing the top five strategies in terms of use frequency and perceived usefulness, we found striking similarities: strategies on both sides involve using either word lists to learn and consolidate new words or reading aloud using phonetic symbols to memorize words. The findings indicate that students in this study tend to believe that what they employed frequently was very useful. This result is quite contrary to what Fan (2003) found in his research when he was examining the strategies used most often and perceived as most useful. He noticed that among the 56 strategies in his questionnaire, only one from the known words category was found to be both often used and perceived as very useful: “In reading a sentence or a passage, when I come across a word I have recently learned, I recall the meaning of the word to help me understand the context.” Such a difference may be accounted for from the perspective of different participants in Fan’s research and this study. The participants in Fan’s study included 1,067 first-year degree students of various disciplines in seven institutions of higher education in Hong Kong; consequently, they are generally more mature and independent in character and more proficient in English. Besides, they came from different high schools and institutions, in which the teaching style and emphasis would be very different. Thus, they might adopt different vocabulary learning strategies. On the contrary, the participants in this study were all senior high school students in Grade One. They were at the age of 15 or 16. Accordingly, they were more easily influenced by their English teacher. In addition, they came from the same high

school. All the participants shared only two English teachers who, according to the interview, have almost the same teaching style, content, and focus.

We are in one teaching team, and we prepare every lesson together and use the same textbook and supplementary material, so the teaching content and focus are basically the same. The only difference is probably that I am an experienced teacher, and she is rather new. (Answer from teacher B)

The only difference is that students in the study used a social strategy often (practicing words with teachers in either oral or written tasks), but did not consider it as one of the most useful. This finding corresponds to that of Wei’s (2012) research, which indicated that Chinese high school students have a tendency to rely more on their teachers rather than take initiative in learning. Therefore, they use this strategy more often (Table 17).

4.3.2 Strategies used least often and perceived as least useful

According to Table 18, there are two strategies, “MEM memorize a word through gestures” and “MEM memorize a word through associating with words of similar spelling or pronunciation,” that were both seldom used and perceived as not useful by the students in this study.

5 Conclusion

The findings of this study offer meaningful insights for vocabulary teaching and learning. Teachers should recognize their students’ preferences for specific vocabulary learning strategies and understand the rationale behind these choices. For instance, given the widespread student use of word lists—a strategy with debated efficacy—teachers should guide learners in employing this method more effectively. This can be achieved by allowing students autonomy in selecting words from textbook lists to focus on, while also ensuring multiple contextualized exposures to these words through reading, listening, and writing practice. Teachers should further help students develop realistic learning plans, identify high-priority vocabulary, and avoid cognitive overload.

As the participants are at an intermediate level and remain highly receptive to teacher guidance, instructors’ awareness of student preferences is essential for designing effective lessons, assignments, and assessments. For students, developing metacognitive awareness of their

TABLE 17 Differences between the strategies used most frequently and the most useful strategies perceived.

Use frequency			Rank	Perceived usefulness		
Item	Mean	SD		SD	Mean	Item
6. DET learn a new word through checking the word list on textbooks	4.06	0.90	1	0.94	4.15	26. COG consolidate a word through word lists in textbooks
26. COG consolidate a word through word lists	4.06	0.90	2	1.03	4.12	24. MEM memorize a word through repeated reading or
13. MEM memorize a word through reading aloud using phonetic symbols	3.82	1.08	3	0.94	4.09	13. MEM memorize a word through reading aloud using phonetic symbols
24. MEM memorize a word through repeated reading or spelling	3.79	1.01	4	0.98	4.03	6. DET learn a new word through checking the word list on textbooks
11. SOC consolidate a word through practicing words with teachers in either oral or written tasks	3.48	0.81	5	1.08	4.01	1. DET learn a new word through reading aloud using phonetic symbols

TABLE 18 Differences between the strategies used least frequently and the least useful strategies perceived.

Use frequency			Rank	Perceived usefulness		
Item	Mean	SD		SD	Mean	Item
30. COG consolidate a word through making plans or goals	2.61	1.10	30	1.04	3.33	16. MEM memorize a word through synonyms or antonyms
18. MEM memorize a word through making sentences	2.61	0.99	31	1.18	3.24	23. MEM memorize a word through grouping words into
5. DET learn a new word through using bilingual dictionary	2.58	1.07	32	0.98	3.21	9. SOC learn a new word through group work
20. MEM memorize a word through gestures	2.39	1.14	33	1.18	2.91	20. MEM memorize a word through gestures
22. MEM memorize a word through associating with words of similar spelling or pronunciation	2.15	1.13	34	0.85	2.76	22. MEM memorize a word through associating with words of similar spelling or pronunciation

own strategy choices enables reflection on which approaches best support their learning. Such reflection helps learners understand their personal learning styles, identify strengths and weaknesses, and gradually foster greater autonomy.

Textbook compilers should also note that while contemporary materials often emphasize communicative approaches, students still rely heavily on and value direct learning strategies such as word lists. A more balanced integration of such strategies within a communicative framework could enhance instructional effectiveness.

In summary, this study reveals that determination and cognitive strategies—such as using textbook word lists and repeated rehearsal—are both the most frequently used and perceived as most useful by first-year senior high school students. In contrast, social strategies and certain memory strategies are the least used and valued. Differences were also observed across proficiency levels. While the self-reported nature of the data presents limitations, the findings contribute a valuable understanding of the vocabulary learning strategies employed by secondary-level English learners.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

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Author contributions

MC: Writing – original draft, Writing – review & editing.

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Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

References

- Barcroft, J. (2009). Effects of synonym generation on incidental and intentional L2 vocabulary learning during reading. *TESOL Q.* 43, 79–103. doi: 10.1002/j.1545-7249.2009.tb00228.x
- Catalán, R. M. J. (2003). Sex differences in L2 vocabulary learning strategies. *Int. J. Appl. Linguist.* 13, 54–57. doi: 10.1111/1473-4192.00037
- Chamot, A. U., and Rubin, J. (1994). Comments on Janie Rees-miller's a critical appraisal of learner training: theoretical bases and teaching implications. Two readers react. *TESOL Q.* 28, 771–776. doi: 10.2307/3587559
- Chen, H. (2001). Strategies for learning English vocabulary by Chinese students who are not English majors. *Foreign Lang. Teach.* 22, 46–50.
- Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.
- Ellis, R. (1994). The study of second language acquisition. Oxford: Oxford University Press.
- Fan, M. Y. (2003). Frequency of use, perceived usefulness, and actual usefulness of second language vocabulary strategies: a study of Hong Kong learners. *Mod. Lang. J.* 87, 222–241. doi: 10.1111/1540-4781.00187
- Fan, L., and Wang, Q. H. (2002). An experimental study of categorical organization strategies in English vocabulary learning. *Foreign Lang. Teach. Res.* 209–212.
- Gu, Y., and Johnson, R. K. (1996). Vocabulary learning strategies and language learning outcomes. *Lang. Learn.* 46, 643–679. doi: 10.1111/j.1467-1770.1996.tb01355.x
- Hang, J., and Li, R. F. (2002). A survey of vocabulary learning concepts and strategies among freshmen students at Tsinghua University. *Tsinghua Univ. Educ. Res.*, 107–113.
- Lawson, M., and Hogben, D. (1996). The vocabulary-learning strategies of foreign language students. *Lang. Learn.* 46, 101–135. doi: 10.1111/j.1467-1770.1996.tb00642.x
- Lee, S. (2007). Vocabulary learning strategies of Korean university students: strategy use, vocabulary size, and gender. *Engl. Teach.* 62, 149–169. doi: 10.15858/ENGTEA.62.1.200703.149
- Lerner, J. W., and Kline, F. (2006). Learning disabilities and related disorders: Characteristics and teaching strategies. Boston, MA: Houghton Mifflin.
- Lessard-Clouston, M. (1996). Chinese teachers' views of culture in their EFL learning and teaching. *Lang. Cult. Curric.* 9, 197–224. doi: 10.1080/07908319609525231
- McCarthy, M. J. (1990). Vocabulary. Oxford: Oxford University Press.
- Nation, I. S. P. (2001). Learning vocabulary in another language. New York: Cambridge University Press.
- O'Malley, J. M., and Chamot, A. U. (1990). Learning strategies in second language acquisition. Cambridge: Cambridge University Press.
- Oxford, R. (1990). Language learning strategies: What every teacher should know. Boston: Newbury House.
- Qing, M., and Kelly, K. (2009). Overcoming hurdles to Chinese students' learning of English Lexis. New York: Routledge.
- Richard, J. (2006). Communicative language teaching today. New York: Cambridge University Press.
- Sagarra, N., and Alba, M. (2006). The key is in the keyword: L2 vocabulary learning methods with beginning learners of Spanish. *Mod. Lang. J.* 90, 228–243. doi: 10.1111/j.1540-4781.2006.00394.x
- Schmitt, N. (1997). "Vocabulary learning strategies" in *Vocabulary: Description, acquisition and pedagogy* [C]. eds. N. Schmitt and M. McCarthy (Cambridge: Cambridge University Press), 199–227.
- Wang, W. Y. (1998). Concepts, strategies, and memorization of English vocabulary. *Foreign Lang. Foreign Lang. Teach.* 47–50.
- Wei, H. J. (2012). The relationship between English vocabulary learning strategies and English performance. *Basic Foreign Lang. Educ.* 4, 27–36.
- Wen, Q. F. (1996). On English learning strategies. Shanghai: Shanghai Foreign Language Education.
- Wilkins, D. A. (1972). Linguistics in language teaching. Cambridge, MA: MIT Press.
- Wu, X., and Wang, Q. (1998). Vocabulary learning strategies for non-English majors. *Foreign Lang. Foreign Lang. Teach.* 55–59.
- Xia, L. Y. (2002). The effect of vocabulary learning strategy research on English learning for non-English majors. *J. Jiangsu Univ.* 24, 53–57. doi: 10.13316/j.cnki.jhem.2002.04.014
- Yao, M. L., and Wu, J. M. (2000). A study of English vocabulary memorization strategies of junior high school students. *Psychol. Sci.* 23, 682–685. doi: 10.16719/j.cnki.1671-6981.2000.06.010
- Zhang, Y. W. (2001). Learners' strategies and vocabulary learning. *J. Shaoxing Coll. Arts Sci.* 21, 44–47. doi: 10.16169/j.issn.1008-293x.s.2001.12.014

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