

Exploring Vocabulary Learning Strategies: Use Trends and Insights from Baccalaureate Students

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Citation: Essafi, M. (2025). Exploring Vocabulary Learning Strategies: Use Trends and Insights from Baccalaureate Students, *Journal of Cultural Analysis and Social Change*, 10(2), 2258-2270. <https://doi.org/10.64753/jcasc.v10i2.1923>

Published: November 16, 2025

ABSTRACT

One of the main challenges for Baccalaureate students is how to optimize their vocabulary acquisition. The best solution for tackling this problem is through the effective use of vocabulary learning strategies (VLSs). Therefore, this study examines the main strategies students utilize to learn vocabulary, the most and least frequently used VLSs, and the patterns of use among the student population. This study employs a mixed-methods approach, in which an 18-item rubric is adapted from Schmitt's taxonomy to gather data from a sample of 114 participants representing 7 high schools in Fez, Morocco. Then a subset of 14 participants is interviewed to gain insights into the VLSs that Baccalaureate students employ to expand their vocabulary skills. The findings reveal variable use of the main strategies—determination, memory, cognitive, metacognitive, and social strategies—students leverage to acquire vocabulary. Further analysis indicates three frequency-based VLSs, including low-use, medium-use, and high-use strategies. In the end, the implications of these findings are outlined, and recommendations for future studies are provided.

Keywords: Baccalaureate Students; Vocabulary Learning Strategies (VLSs); Schmitt's Taxonomy; Vocabulary Learning Strategies Questionnaire (VLSQ).

INTRODUCTION

As evidenced by research, vocabulary learning plays a pivotal role in enhancing language skills, namely reading, listening, writing, and speaking (Harris, 1969; Siribodhi, 1995). In addition, a solid and rich repertoire of vocabulary makes our language clearer and more diverse (Beck et al., 2002; Evans, 1978). That said, the incorrect use of vocabulary can lead to communication breakdowns and misunderstandings, preventing the learners from developing language proficiency (Spada & Lightbown, 2006). Similarly, an insufficient depth and breadth of vocabulary restricts students' effectiveness in receiving and producing the language (Blake, 2013). Therefore, enhancing students' vocabulary skills is key to developing their language proficiency (Carter & McCarthy, 2014; Nation 2001).

According to Schmitt (2002), language learning strategies refer to the semi-conscious and conscious behaviors and ideas students utilize to optimize their acquisition of the target language. Vocabulary learning strategies (VLSs), being a subset of language learning strategies, specifically target vocabulary development. VLSs, Schmitt states, are "any sets of operations, steps, plans, and routines used by the learner to facilitate the obtaining, storage, retrieval, and use of information." (Carril, 2009, p.69). These strategies are used by vocabulary learners at distinct stages to optimize the acquisition and retention of targeted vocabulary. In addition, vocabulary acquisition strategies vary significantly between learners depending on several factors, including gender, age, personality, attitude, and proficiency level.

VLSs are crucial for learners to effectively expand their vocabulary knowledge; however, students are not familiar with the majority of them, or if they are, they most of the time use them inconsistently and/or inefficiently.

Furthermore, many research studies—these will be tackled subsequently—have shown that students can make use of previously acquired words; yet, most of these words are often forgotten shortly after being acquired. Consequently, the current study explores the main strategies Baccalaureate students utilize to learn vocabulary, the most and least frequently used VLSs by students, and the patterns of use among the student cohorts. This broad objective can be divided into three specific objectives: (i) to examine the main strategies Baccalaureate students utilize to acquire vocabulary; (ii) to explore the most and least frequently used VLSs by students; and (iii) to obtain an insight into the patterns of use of VLSs among the student body. From these objectives, the following questions can be developed:

- a. What are the main strategies Baccalaureate students utilize to acquire vocabulary?
- b. What are the most and least frequently used VLSs by Baccalaureate students?
- c. In what way do students leverage VLSs to optimize their vocabulary acquisition?

LITERATURE REVIEW

Vocabulary Learning

Vocabulary serves as the essential building block for linguistic proficiency, as it not only plays a vital role in effective communication but also holds significance in acquiring a variety of language skills and aspects. Surmanov and Azimova (2020) suggest that vocabulary learning is at the center of language learning, irrespective of whether it is an individual's first, second, or foreign language. Similarly, Wilkins (1972) summarized the significance of vocabulary acquisition saying that *"without grammar, very little can be conveyed; without vocabulary, nothing can be conveyed."* (p. 111). To elaborate, both grammar and vocabulary are essential to communication; however, while it is possible for people not mastering the grammatical rules to comprehend—though with difficulty—linguistic messages, those with deficient lexical knowledge cannot understand one another at all, as meaning is mostly inherent to vocabulary items.

According to Wallace (1989), attaining vocabulary proficiency requires learners to comprehend, among other elements, word meaning, word use, collocation, spelling, and pronunciation. Nevertheless, limited vocabulary may impede learners' ability to communicate fluently and understand texts (Hai-peng & Li-jing, 2007). Hence, learners should be encouraged and guided to broaden and deepen their vocabulary skills so that they can communicate their messages accurately and confidently. In addition, there is a strong connection between vocabulary acquisition and communicative competence. In this regard, Hatch (1983) noted that effective communication significantly relies on the strategies students use to acquire vocabulary. In a similar vein, Wyra and Lawson (2018) stressed the value of vocabulary for language users, especially in achieving communicative competence, both in and out of the classroom. Therefore, students should prioritize vocabulary learning, as it promotes reciprocal comprehension and effective communication among language users.

Classifying Vocabulary Learning Strategies

While numerous frameworks for categorizing VLSs are available, Schmitt's taxonomy (2000), the most prominent of these models, forms the foundation of the current study. Schmitt's model includes 58 VLSs distributed across five categories, namely determination, memory, cognitive, metacognitive, and social strategies.

Determination strategies refer to methods learners use to discover the meanings of new words without external assistance (Schmitt, 2000). These strategies typically involve using dictionaries, inferring meanings from contextual clues, and analyzing word structures. According to Atifnigar (2020), the main determination techniques are as follows: using reference materials, guessing meanings from the context, and parsing words.

Memory strategies are techniques designed to help students remember, store, and retrieve acquired information effectively (Atifnigar, 2020). They assist learners in recalling vocabulary by creating meaningful connections and organizing words in a way that enhances retention (Ali & Anwar, 2021). These strategies include linking new words to prior knowledge through imagery, word grouping, and contextual associations (Schmitt, 2000).

Cognitive strategies are mental processes and techniques that enhance the acquisition, retention, and retrieval of new words. These strategies help students actively perform in the target language, making it more tangible and accessible. Cognitive strategies consist of practical techniques for directly engaging with vocabulary, such as taking notes, using flashcards, and keeping vocabulary notebooks (Milton, 2009).

Metacognitive strategies include actions that go beyond cognitive functions, allowing learners to coordinate their learning process through planning, monitoring, and evaluating their progress (Oxford, 1990). They encourage students to take control of their learning by self-regulating and self-assessing their performance (Hedge, 2000). The main metacognitive strategies are monitoring, decision-making, and self-testing (Kafipour & Naveh, 2011).

Social strategies aid in vocabulary development by allowing learners to interact actively with others in order to obtain and exchange information (Atifnigar, 2020). These approaches involve communicating with others and learning from them (Schmitt, 2000). Social strategies include asking instructors, classmates, or native speakers for word meanings, thereby maximizing vocabulary learning through interactive communication (Schmitt, 2000).

Research on Vocabulary Learning Strategies

There is a substantial body of research on vocabulary learning, a large part of which investigates the strategies students leverage for effective acquisition of vocabulary. This section presents the main findings of some of these studies, offering insights into the most and least frequently used VLSs by students and the implications of these outcomes for the teaching and learning of vocabulary.

In a study conducted by Atifnigar et al. (2020), 67 university students were asked to report on a rubric adapted from Oxford's (1990) taxonomy of VLSs. The study aimed to explore the VLSs used by English as a Foreign Language (EFL) learners. The results revealed that EFL learners are medium users of VLSs. In addition, social strategies were shown to be the most preferred, and metacognitive strategies were found to be the least utilized by learners. The authors suggested that teachers revise their instructional practices to enhance learners' VLSs.

Similarly, Rabadi (2016) performed a study to investigate the various VLSs that are prevalent among university students. A 40-item questionnaire, following Schmitt's taxonomy, was administered to a pool of 110 students. The outcomes indicated that Jordanian EFL learners are moderate strategy users. The findings also showed that, while metacognitive strategies were the least employed, social strategies were the most prevalent among students. In the end, it was suggested that curriculum designers base the curriculum on students' preferred VLSs and that teachers improve their vocabulary teaching techniques.

In the same line, Zarrin et Khan (2014) undertook a study among 46 undergraduate students. The study used an adapted 21-item questionnaire, based on Schmitt's (1997) VLSQ. The purpose of this research was to examine the use of VLSs by students. The findings indicated that memory strategies were the most frequently employed while metacognitive strategies showed the lowest use among those surveyed. The study suggested that learners be trained on the use of VLSs so that they can take responsibility of their vocabulary acquisition.

METHODOLOGY

Research Design

This research utilizes a mixed-methods design and aims to explore the main strategies Baccalaureate students employ to acquire vocabulary, the most and least preferred VLSs, as well as the patterns of use among students. Since it is mixed-methods, the adopted approach is based on two processes: (i) the collection of quantitative data through a specific 18-item framework; and (ii) the validation and enhancement of data through a qualitative instrument, namely semi-structured interviews.

Participants

The current study was conducted in different high schools of Fez, in Morocco. The sample of this study was composed of 54 males and 60 females. The 114 participants included 51 students from the first-year Baccalaureate (11th grade) and 63 from the second-year Baccalaureate (12th grade), randomly drawn from the student population of the concerned high schools. The population sample covered three main academic streams: Mathematical Sciences (N=33); Human Sciences (N=37); and Experimental Sciences (N=44). Participants were all enrolled in public schools and had been studying English as a foreign language (EFL) since grade 9.

Instrumentation

In alignment with the quantitative aspect of this study, data was gathered via the administration of a vocabulary learning strategies questionnaire (VLSQ), adapted from Schmitt's (2000) and other VLS-related frameworks (Bennett, 2006; Cook, 2001; Gu & Johnson, 1996; Nation, 2001; Zarrin & Khan, 2014). Originally consisting of 58 Likert-scale items, the adapted VLSQ included only 18 items, as many items were either regrouped, modified, or left out to suit the specific context of this study. The selected items were distributed across five categories, specifically determination (items 1–3), memory (items 4–8), cognitive (items 9–11), metacognitive (items 12–14), and social strategies (items 15–18).

The adaptation of the original VLSQ was based on contextual, methodological, and practical considerations. First, this reduction was undertaken to make the VLSQ more relevant to both the Moroccan context and the proficiency level of the Baccalaureate students. Another reason for modifying the 58-item VLSQ was to better align with the general digital trends and preferences in vocabulary strategy use. Third, many items were adapted in response to the feedback from the pilot-tested participants and the analysis of the pilot data. Last, the original

VLSQ was narrowed down to 18 items to reduce the cognitive load on participants, thus minimizing the risk of survey fatigue and ensuring the reliability and validity of the responses.

The adapted/adopted 18-item rubric employs a 5-point rating scale ranging from "never" to "always." Student responses are rated as follows: "never" (1); "rarely" (2); "sometimes" (3); "often" (4); and "always" (5). This scale allows participants to indicate the frequency of their preferences or behaviors regarding vocabulary learning strategies (Nunan, 1992). The scoring system for strategy use ranges from 0.00 to 5.00. Scores falling between 1.00 and 2.40 signify low strategy use, those between 2.50 and 3.40 denote medium use, and values from 3.50 to 5.00 represent high use (Schmitt, 1997; Oxford, 1990).

To match the requirements of the qualitative component of this research and as a follow-up to the VLSQ instrument, semi-structured interviews were chosen as they allow, on one side, interviewees to express freely their thoughts and feelings, and, on the other side, interviewers to adapt questions freely depending on the flow of the conversation. The semi-structured interviews tackled the 18 VLSs used by students across three main categories: (a) high-use strategies; (b) medium-use strategies; and (c) low-use strategies. The interview questions used straightforward language to prevent ambiguity or complex phrasing (Zohrabi, 2013).

Reliability and Validity

The VLSQ instrument was found to be reliable and valid. Cronbach's alpha was equal to 0.72, denoting the consistency of the survey's items. Concerning validity, two seasoned colleagues analyzed the VLSQ, approving its clarity and design. The instrument was also piloted before administration. Similarly, the trustworthiness of the interview instrument was ensured by the authors' sharing of interview findings with participants, discussing the research process and outcomes with two experts, and recording all steps of the research process.

Procedures

To attain the aims of the study, several procedures were applied. In the quantitative phase of data collection, the VLSQ instrument was pilot-tested on ten conveniently sampled students from the concerned high schools, upon which some items of the VLSQ instrument were modified, as explained in the previous section. Then 114 copies of the narrowed-down rubric were distributed on different days across seven high schools in Fez. Participants were offered an overview of the research objectives and assured of the anonymity and research-exclusive use of their responses. They also had the choice to either provide their written consent and proceed with the study, or decline participation if they wanted.

In the qualitative stage of data gathering, the interview instrument was also subjected to pilot testing before the main study. Based on the feedback provided by three EFL colleagues, certain questions were refined to enhance clarity and effectiveness. Next, the 14 interviews were conducted face-to-face and on an individual basis. Each interview lasted 20–25 minutes and was either recorded or not, based on the interviewee's preference. The participants who took part reaffirmed their consent—after being informed of the study's topic, scope, and objectives—before the start of the interviewing process.

As with data collection, data analysis also comprises two phases. First, Statistical Package for the Social Sciences (SPSS) was drawn upon to analyze descriptively and inferentially the quantitative data of this study. The aim in this phase was to investigate the VLSs students utilize to learn vocabulary as well as the most and least frequently used of these VLSs by students. Done with quantitative analysis, the data from the interviews was qualitatively examined in line with Creswell's (2014) six-step model, including organizing, reading through, coding, categorizing, presenting, and interpreting. The analysis, reinforced with students' quotations, targeted the ways Baccalaureate students leverage VLSs to optimize vocabulary acquisition.

RESULTS

Research Question 1

RQ1: What are the main strategies Baccalaureate students utilize to acquire vocabulary?

To answer this question participants' response were first gathered, using the 18-item rubric, and then analyzed, utilizing the SPSS software. Let us descriptively present the outcomes before inferentially dealing with them.

Table 1. Descriptive Statistics for the Frequency of the Main VLSs Used by Students

	N	Minimum	Maximum	Mean	Std. Deviation
Mean_of_All_Strategies	114	1.69	4.33	3.0720	.50828
Determination_Strategies	114	1.67	4.67	3.1754	.70427
Memory_Strategies	114	1.80	4.80	3.0772	.69512
Cognitive_Strategies	114	1.00	5.00	3.1228	.83820
Metacognitive_Strategies	114	1.33	4.67	2.5351	.83155
Social_Strategies	114	1.00	5.00	3.4496	1.09513
Valid N (listwise)	114				

Table 1 reveals the overall strategy use by students, which is equal to 3.07, suggesting that learners exhibit moderate use of VLSs. The table also illustrates the descriptive statistics concerning each of the five categories of VLSs used by learners. Social strategies attained the highest mean score ($M=3.44$). Determination strategies ranked second with a mean score of ($M=3.17$), while cognitive strategies and memory strategies followed closely behind at third ($M=3.12$) and fourth ($M=3.07$) places, respectively. Conversely, metacognitive strategies received the lowest score ($M=2.53$) among the five sets of VLSs employed by students.

Research Question 2

RQ2: What are the most and least frequently used VLSs by Baccalaureate students?

In response to this question, I once again used SPSS to analyze data from the survey instrument. Hence, mean scores, standard deviations, and frequency categories were drawn upon to find the most and least frequently used strategies by students to maximize vocabulary learning.

Table 2. Determination Strategies Used by Students to Learn Vocabulary

Determination Strategies Used by Students Category	Mean	SD	Frequency
1. I look up words in (online) dictionaries.	4.04	1.27	High use
2. I guess the meaning of words from the context.	3.26	.54	Medium use
3. I break words down into their constituents.	2.21	1.44	Low use

As shown in Table 2, the mean frequency scores of the three strategies differ significantly. Hence, while the strategy “I look up words in (online) dictionaries” is widely utilized ($M=4.04$; $SD=1.27$) by the participants, “I guess the meaning of words from the context” is moderately employed ($M=3.26$; $SD=0.54$), and “I break words down into their constituents” exhibits low levels of use ($M=2.21$; $SD=1.44$).

Table 3. Memory Strategies Used by Students to Learn Vocabulary

Memory Strategies Used by Students	Mean	SD	Frequency Category
4. I use words in example sentences.	3.96	.84	High use
5. I create mental images of new words.	2.95	1.12	Medium use
6. I link the word with synonyms and/or antonyms.	2.76	1.25	Medium use
7. I study words from the same thematic field.	2.50	1.27	Medium use
8. I use collocations (words that go together).	3.19	1.07	Medium use

Table 3 presents the mean frequency scores of five memory strategies. Therefore, “I use words in example sentences” ($M=3.96$; $SD=0.84$), is reported to be extensively used by Baccalaureate students, in comparison with the other moderately utilized strategies, including “I create mental images of new words” ($M=2.95$; $SD=1.12$), “I link the word with synonyms and/or antonyms” ($M=2.76$; $SD=1.25$), “I study words from the same thematic field” ($M=2.50$; $SD=1.27$), and “I use collocations” ($M=3.19$; $SD=1.07$).

Table 4. Cognitive Strategies Used by Students to Learn Vocabulary

Cognitive Strategies Used by Students	Mean	SD	Frequency Category
9. I highlight/color-code important words.	3.84	1.23	High use
10. I take note of new words and phrases.	3.28	1.20	Medium use
11. I use flashcards and word lists.	2.23	1.28	Low use

As revealed in Table 4, the mean frequency scores of cognitive VLSs exhibit all three types of frequency use. Participants reported a wide use of “I highlight/color-code important words” ($M=3.84$; $SD=1.23$). They also indicated a medium level of use of “I take note of new words and phrases” ($M=3.28$; $SD=1.20$) and a low level of reliance on “flashcards and word lists” to expand their vocabulary ($M=2.23$; $SD=1.28$).

Table 5. Metacognitive Strategies Used by Students to Learn Vocabulary

Metacognitive Strategies Used by Students	Mean	SD	Frequency Category
12. I monitor my vocabulary growth.	1.50	.78	Low use
13. I review newly learned words regularly.	2.52	1.25	Medium use
14. I test my vocabulary skills (using online tools).	3.57	1.23	High use

Table 5 highlights the mean frequency scores of three metacognitive strategies. Hence, “I monitor my vocabulary growth” is suggested as the least utilized strategy ($M=1.50$; $SD=0.78$) in this category and overall. However, “I review newly learned words regularly” is reported as moderately utilized ($M=2.52$; $SD=1.25$), and “I test my vocabulary skills” as frequently employed by the survey participants ($M=3.57$; $SD=1.23$).

Table 6. Social Strategies Used by Students to Learn Vocabulary

Social Strategies Used by Students	Mean	SD	Frequency Category
15. I use AI models such as Chat-GPT, Gemini, etc.	4.39	1.00	High use
16. I communicate with native speakers (online).	3.59	1.54	High use
17. I interact with peers via (virtual) study groups.	3.44	1.59	Medium use
18. I seek help from my English language teacher.	2.35	1.55	Low use

In Table 6, the mean frequency scores of four social strategies are presented. To begin with, “I use AI models such as Chat-GPT, Gemini, etc.” is depicted as the most utilized strategy ($M=4.39$; $SD=1.00$) not only in this category but across all 18 VLSs. “I communicate with native speakers (online)” ($M=3.59$; $SD=1.54$) is another strategy that exhibits high use by participants. On the other hand, “I seek help from my English language teacher” ($M=2.35$; $SD=1.55$) is the least employed VLS in this category, and “I interact with peers via (virtual) study groups” ($M=3.44$; $SD=1.59$) suggests a medium level of use by students.

Research Question 3

RQ3: In what way do students leverage VLSs to optimize their vocabulary acquisition?

Research question 3 is a follow-up to the second research question in this study. To analyze the findings from this question, content analysis was employed. Hence, upon the completion of the interviewing process, field notes from this phase were organized and prepared, themes were identified and categorized, and outcomes were described and interpreted. In what follows, I present, reinforced with student quotations, the ways participants reported using VLSs to enhance their vocabulary acquisition.

Determination Strategies

The first part of the interview was about the ways students use determination strategies, such as “using (online) dictionaries,” “guessing meanings from the context,” and “parsing words into their parts” to develop their vocabulary skills. The following are excerpts from students’ responses:

“I rely heavily on ‘Q Dictionary’ for building my vocabulary. It provides clear translations (to Arabic) that aid in my grasp of new words,” (Lina). Most students, especially first-year BAC ones, said that they prefer bilingual/translating dictionaries to English-English dictionaries because they are faster and easier to understand.

“When I encounter unfamiliar words, I try to figure out what they mean from the surrounding words. It’s a skill I’ve developed over time, and it has worked well so far, especially in tests and exams,” (Badr). Worth mentioning, students revealed that they rarely use “guessing” beyond classroom learning and testing situations.

Some students reported utilizing another determination strategy, as disclosed by Chaimae, *“Breaking words down into their parts helps me get what they are about.”* However, other students mentioned that this strategy is more relevant for understanding word forms or classes than for interpreting word meanings.

Memory Strategies

In the second part of the interview, I asked my interviewees about how they leverage memory strategies, namely “using example sentences,” “creating mental images,” “using synonyms/antonyms,” “using thematic fields,” and “collocations” to enhance their vocabulary skills. Below are selected passages from their comments:

“Whenever I learn a new word, I try to use it in a sentence. It helps me better grasp it and know how to use it correctly,” (Brahim). Interviewees noted that, as they rely only on ‘knowing’ the words, without contextualizing them, they are soon to forget them. Paradoxically, they are aware of this problem, but they feel helpless about it.

Regarding mental imagery, students stated that *“picturing new words in [their] mind,”* by linking them to their personal experiences, as Salma explains, *“helps [them] retain these words much better.”* Some students also mentioned combining mental strategy with other VLSs like mind mapping for effective vocabulary retention.

For the remaining strategies, which can all be classified as ‘word association’ strategies, the following were student responses: *“When I encounter a new word, I immediately try to think of other words that mean the same thing or the opposite,”* (Douâe); *“Mind mapping is like putting together pieces of a puzzle to see the big picture,”* (Ilyas); *“It’s amazing how words have their favorite partners, and knowing this fact helps me use them correctly,”* (Hajar). A shared feature of these VLSs is their focus on developing learners’ grasp of both word meanings and word relationships. Students revealed a preference for synonyms/antonyms, as they are easy to use and needed in tests/exams. Mind mapping and collocations were reported as often limited to vocabulary classes.

Cognitive Strategies

The third part of the interview revolved around the ways students employ cognitive strategies, namely “highlighting,” “note-taking,” and “flashcards/word lists” to improve their vocabulary knowledge. Here are some segments from student remarks:

“Highlighting” is a popular strategy among students, as it enables them *“to focus on the most important words and makes them easier to review later,”* (Fatima). Students, mostly female ones, indicated that they consistently engage with this *“time-saving”* strategy, combining it with annotations, to enhance contextual understanding.

“Note-taking” is another cognitive strategy, which, as disclosed by Wissam, *“has changed [students] vocabulary learning from passive to active and has helped [them] with writing tasks.”* While acknowledging its value, students, mostly 11th graders, suggested that they only use it when prompted by teachers. They ascribed this practice to their being often overwhelmed with other academic tasks and their lack of effective note-taking skills.

Concerning “Flashcards/word lists,” while most students find them *“boring,”* some students reported using them, as noted by Aya, *“to check [their] grasp of new words.”* Further, they revealed a preference for manual over digital flashcards/word lists, as, being created by them, paper-based tools are more tied to the curriculum.

Metacognitive Strategies

In Part 4 of the interview, questions targeted the ways students employ metacognitive strategies, such as “monitoring,” “reviewing,” and “self-testing” to maximize their vocabulary acquisition. Displayed below are selected passages from students’ statements:

To begin, most students disclosed that they, *“don’t monitor [their] vocabulary because [they] haven’t been taught how to do it,”* (Imane). In addition to lack of guidance, students mentioned lack of time as another barrier to tracking vocabulary expansion. Even so, a minority of students shared that sometimes they check how their vocabulary is growing, a skill that they had developed through their interaction with vocabulary learning apps.

Regarding “reviewing,” while many female students reported a regular practice of this strategy, describing it as, *“essential and rewarding,”* most male students revealed that they most often, *“rely on quick reviews before tests,”* citing ‘device addiction’ as largely responsible for this phenomenon of ‘last-minute revision’.

As for “self-testing,” students recognized the value of digital tools in enriching their vocabulary, as suggested by Yassine, *“I regularly challenge myself with online vocabulary quizzes in Vocabulary.com.”* Students also mentioned apps like Duolingo, Memrise, and Vocabulary Builder as effective tools for vocabulary testing.

Social Strategies

The sixth and last part of the interview was about the ways students use social strategies, namely “AI models,” “native speakers,” “peers,” and “teachers” to improve their vocabulary skills.

Technology has been revolutionizing language learning by offering diverse mobile applications and digital platforms for language practice. Recently, AI technology has advanced significantly, enabling learners to engage in human-like conversations with AI models. Moroccan students have jumped on the bandwagon of integrating AI into their language learning habits, as revealed by Lina, *“ChatGPT has been a great help to me. It feels like talking to a friend who offers useful tips on language use, which allows me to pick up new words while chatting.”*

Despite the growing dependence on AI tools, students continue to show reliance, though to a much lesser extent, on traditional social strategies, as indicated in subsequent selections from student responses:

"I've been using Tandem to practice English with native speakers for two years. This experience has improved my vocabulary, as I can now hold actual discussions and see how words are used in real situations," (Badr). Nonetheless students admitted that, as AI tools are taking precedence, this practice is becoming less common.

In addition, students highlighted the key role peer interaction plays in vocabulary enhancement, as explained by Walid, *"In our group discussions, I usually ensure to ask my classmates about the meanings of unfamiliar words."* According to students, peer interaction for vocabulary acquisition has been shifting to online platforms, such as WhatsApp and Facebook, as these digital tools transcend the constraints of physical meetings.

Last, students also reported depending on teachers for vocabulary learning, as noted by Hiba, *"When I encounter a difficult word, I seek help from my teacher. His explanations greatly improve my understanding."* However, according to students, AI models and peers are displacing teachers as the primary source of support for them.

DISCUSSION

The first question in this research inquired about the main strategies Baccalaureate students use to enhance their vocabulary skills. To answer this question, student responses were first gathered via an adapted version of Schmitt's VLSQ instrument, and then dealt with using SPSS. The findings showed that participants are moderate VLS users ($M=3.07$). This finding matches the findings of several studies (Jafari & Kafipour, 2013; Rabadi, 2016; Zarrin & Khan, 2014), which also indicated that students are medium strategy users. This demonstrates, according to Oxford (1990), that students are aware of the VLSs they are using, but they need further encouragement and guidance to leverage them more to enhance their learning experience.

Statistics also revealed that, while social strategies had the highest mean score, metacognitive strategies received the lowest score, and determination, cognitive, and memory strategies fell in between, respectively. These findings are consistent with those of many researchers (Atifnigar et al., 2020; Jafari & Kafipour, 2013; Nematollahi et al., 2017), and partially similar to those who reported metacognitive strategies as the least frequently used and other strategies—than social strategies—as the most preferred by students (Kaya 2014; Zarrin & Khan, 2014). This implies that theoreticians and practitioners should favor activities grounded in social strategies, including physical and AI-based interactions, when designing activities for vocabulary learning. Further, they need to train students to be autonomous learners, capable of engaging in self-regulatory practices, through the explicit instruction of metacognitive and determination strategies.

With that in mind, other studies found either memory (Rabadi, 2016; Zarrin & Khan, 2014), cognitive (Arjomand & Sharififar, 2011), or metacognitive (Cengizhan, 2011; Riazi & Rahimi, 2005) strategies to be the most popular among learners; and cognitive (Cengizhan, 2011; Celik & Toptas, 2010) or social strategies (Arjomand & Sharififar, 2011; Nematollahi et al., 2017) to be the least preferred by students. These results can be justified by the specificities of the contexts in which these studies were conducted. Generally, memory strategies thrive in settings where rote learning and exam-oriented education are the norm; cognitive strategies may prevail due to their practicality and alignment with analytical learning styles; and metacognitive strategies could denote a context in which learner-centeredness and independent learning are adopted.

Done with discussion one (=RQ1), this section addresses two questions simultaneously, by investigating, on the one hand, the most and least frequently used VLSs by students (=RQ2), and on the other hand, the patterns of use of these strategies among the student population (=RQ3). The reason for adopting this dual-focused approach is to ensure a logical progression from listing preferences to analyzing practices. As a result, the quantitative and qualitative findings will be discussed drawing on statistics, student quotations, and relevant literature.

High-use Strategies

High-use VLSs are strategies that students reported using the most for learning vocabulary. These are dictionary use, contextualizing, highlighting, self-testing, and interacting with native speakers and voices. To begin, dictionaries were reported to be highly used ($M=4.04$) as a VLS by students. When interviewed, students echoed this finding, describing dictionaries, particularly online and translating ones, as *"efficient"* and *"reliable."* Research supports this finding, seeing dictionaries as a vital resource for obtaining information about lexical items (Summers, 2014); hence the need for training learners on dictionary use (Tosuncuoglu, 2007) and helping them transition to English-English dictionaries as their proficiency grows. In addition to dictionary use, putting words into sentences was also frequently used ($M=3.96$). Interviewees confirmed this finding, suggesting that contextualizing words helps students move on from receptive to productive vocabulary. This entails that contextual vocabulary learning should be foregrounded, as embedding words in meaningful contexts has proven to be effective for word retention and use (Fengyu, 2023; Malyugina, 2021). Teachers can foster this habit by including it as a regular practice in all English language components. Highlighting was also found prevalent among students ($M=3.84$), especially female ones. Some students explained that highlighting enables them, *"to focus on the most important words,"* facilitating the

task of reviewing. Previous studies showed that highlighting aids in reducing cognitive load by allowing students to focus on essential terms (Yeari et al., 2017), thereby facilitating vocabulary detection and recall (Zarrin & Khan, 2014). Students should be encouraged to develop this habit, preferably in tandem with other VLSs, such as note-taking and reviewing.

With a score of 3.57, self-testing is another VLS that was found widely used by students. Qualitative responses specified that this practice is prevalent in students' social media groups, where students share links to apps and digital platforms. According to the literature, self-assessment enables students to identify and address their learning gaps (Albakri, 2024), thus emerging as a key tool for extending lexical memory (Kafipour & Naveh, 2011) and fostering learner autonomy (Gardner, 2000). This strategy fits effectively within the Moroccan curriculum, where there is a growing emphasis on learner autonomy and app-based learning. As reported in descriptive statistics, interacting with AI models displayed the highest use ($M=4.39$) among all items of the VLSQ. This result was confirmed during interviews, with many students describing these tools as, "*indispensable*," "*true friends*," and "*an obsession*." This can be ascribed to the accessibility and convenience of such models, often lauded for offering instant and customized responses to different language-related questions (Allam et al., 2023; Dilzhan, 2024). Teachers can leverage these AI tools (e.g., apps and chatbots), by finding ways to integrate—rather than alienate—them into their vocabulary teaching practices. Last, communicating with native speakers is another VLS that students indicated frequently utilizing ($M=3.59$) for optimizing their vocabulary acquisition. During interviews, students revealed that this practice, though recently largely overshadowed by AI tools, is still "*resisting*." According to Atifnigar (2020), interacting with natives is effective for practicing vocabulary in meaningful situations.

Medium-use Strategies

Medium-use VLSs comprise strategies that were indicated as moderately used by students. These can be divided into two sets: memory strategies and hybrid strategies. Let us begin by discussing memory strategies, namely mental imagery and association strategies (e.g., synonyms/antonyms, mind mapping, and collocations). Initially, mental imagery is one of four memory strategies that displayed medium use ($M=2.95$). Interviewees' feedback revealed that students often combine this strategy with other VLSs like mind mapping, and highlighting, without being aware of it. This echoes previous research, which suggests that pairing mental imagery with other VLSs can significantly improve students' focus and analytical skills (Liling, 2023). In light of this, learners should be encouraged to use mental imagery, as this dual-coding technique is effective in enhancing visual memory. Additionally, 'word associations' strategies—synonyms/antonyms ($M=2.76$), mind mapping ($M=2.50$), and collocations ($M=3.19$)—were found to be of medium use by students. During interviews, students reaffirmed this moderate use while disclosing a little preference for synonyms/antonyms strategy, as it is "*simpler*," "*easier to use*," and "*more relevant for test-taking situations*." Interviewees also noted the somewhat restricted use of mind mapping and collocations to vocabulary classes. Similarly, researchers have found the use of "word associations" to reinforce the grasp and recall of new words (Cojocnean, 2015). For instance, the use of semantic clustering was found to be highly effective in enhancing students' vocabulary both receptively and productively (Heidari-Shahreza (2015). That said, effective use of 'association strategies' often requires their application in authentic situations (Nation, 2001; Schmitt, 2000). Hence, teachers are required to design meaningful activities that stress the complementarity of these strategies, moving beyond the fragmented exam-focused approach.

Done with memory strategies, the focus shifts to hybrid strategies, including contextual guessing (determination), note-taking (cognitive), reviewing (metacognitive), and engaging with peers (social). First, contextual guessing ($M=3.26$), is a determination strategy that students suggested moderately relying on. However, interviewees revealed favoring dictionaries or ChatGPT as VLSs, using contextual guessing only when these resources are, "*unavailable*," or "*not allowed*." Former scholars advised using guessing from context, as it develops not only students' vocabulary knowledge (Muthuchamy, 2019) but also their reading comprehension skills (Al-Ghazo & Ta'amneh, 2022). Modeling, guidance, and timely feedback are effective ways teachers can foster this skill in students. Another strategy that showed moderate use by students is note-taking ($M=3.28$). Some interviewees reported observing significant progress since engaging in this practice, while others forwarded time constraints and low motivation as barriers to embracing this technique. As noted in the literature, students should be trained on regular note-taking for its role in honing vocabulary, listening, and reading skills (Arianto, 2018; Rusdiansyah, 2019). Hence, learners should be motivated and equipped them with the necessary skills to adopt this strategy as a regular practice for both intentional and incidental vocabulary acquisition. Third, reviewing ($M=2.52$), while valued by interviewees, was reported as inconsistently used, mainly due to procrastination and distractions. According to Lindsey et al. (2014), regular reviewing enables students to optimize course retention, and consistently extend their vocabulary. This suggests a need for learners to adopt regular reviewing habits and address procrastination and distraction issues through procedures, such as goal setting, time management, and spaced repetition. Last, engaging with peers ($M=3.44$), is another VLS that is moderately leveraged by students. Interviewees confirmed this finding, aligning with previous studies, which found this strategy to be a valuable

practice for acquiring and recalling word meanings (Baskin et al., 2017; Cojocnean, 2015). These findings should inspire teachers to adopt, on the one hand, traditional techniques like group discussions, vocabulary games, and peer feedback; and on the other hand, digital tools, such as Kahoot, Quizizz, and Blooket to help students develop vocabulary competency while acquiring social skills.

Low-use Strategies

This last category of VLSs represents strategies that are used the least by students. These include word parsing, flashcards/word lists, monitoring, and relying on teachers. To begin with, word parsing ($M=2.21$), is one of the four strategies that displayed low use by students. According to Schmitt (2000), word families should be prioritized in teaching. Even so, interviewees declared finding this practice to be more effective for understanding word forms/classes than for deducing word meanings, hence the need for teachers to pair this strategy with other VLSs like contextual guessing and dictionary use. Similarly, the limited use of flashcards/word lists ($M=2.23$) reflects students' preference for techniques that promote authentic learning (Milton, 2009). Most interviewees explained that they find flashcards/word lists, "*repetitive and boring*," hence indicative of rote learning. Having said that, including these tools in interactive activities like challenges and games can make them more interesting. The third strategy that was found to be less preferred by students is monitoring ($M=1.50$). Interviewees mentioned lack of time and guidance as the main reasons for not engaging with this strategy. According to Stone (2000), many students struggle to monitor effectively their learning. Nevertheless, when tooled with the necessary self-monitoring skills, students can enhance their self-regulatory practices (Alserhan et al., 2023). Last, reliance on teachers ($M=2.35$) showed low use by students. One reason for this, according to interviewees, is the on-demand availability of another alternative: ChatGPT. Another cause is the familiarity of seeking help from peers (Adam & Magfirah, 2022). Therefore, teachers might need to integrate these '*supportive partners*' into their teaching practices to meet students' evolving needs.

CONCLUSION

This study explored the main strategies students employ, the most and least frequently used VLSs, and the patterns of use of these VLSs among Baccalaureate students. The findings revealed that students are moderate users of VLSs overall, social strategies are the most frequently used, and metacognitive strategies are the least prevalent among students. The findings also suggested three types of strategies, based on their frequency of use: (i) high-use strategies, namely dictionary use, contextualizing, highlighting, self-testing, and interacting with native speakers and voices; (ii) medium-use strategies including mental imagery, association strategies, contextual guessing, note-taking, reviewing, and engaging with peers; and (iii) low-use strategies, such as word parsing, flashcards/word lists, monitoring, and relying on teachers.

The current study exhibits two main limitations. To begin, some factors were not taken into account when undertaking this study, such as gender and the proficiency level of the students. There would definitely be a relationship between these variables and the VLSs reported by students. Future studies might consider including these factors to better contextualize strategy use. Further, data was gathered at a single point in time. This procedure overlooked changes that might affect strategy use over time, especially in this AI-driven era. Opting for longitudinal studies to track changes in strategy use may be a solution to this limitation.

The findings of this study have implications for curriculum designers, teachers, and learners. First, it is recommended that curriculum designers base the curriculum on students' preferred VLSs, especially AI-driven ones, to make learning optimal and up-to-date. Besides, textbook design should reflect the variability of strategy use by students to render learning convenient and customized. Second, these findings should inspire teachers to prioritize teaching social strategies while taking into account the complementarity of VLSs and the different needs of students. Further, teachers are required to focus on the explicit instruction of VLSs that foster learner autonomy, including determination and metacognitive strategies. Finally, students need to become aware of these VLSs and practice them not only for exams but also for personal development. In addition, learners should take charge of their learning by actively engaging in vocabulary enhancement, both intentionally and incidentally.

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