

Educational Pathways in Vocabulary Learning: What Individual Strategies Reveal about Learners

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Abstract

Vocabulary Learning Strategies (VLSs) support vocabulary development and learner autonomy in second and foreign language learning. Although previous studies have examined a range of learner-related variables associated with VLS use, educational factors have received comparatively less attention. This study explored the VLSs employed by 668 Bruneian university students learning English and seven foreign languages and investigated whether strategy use differed according to degree year, field of study, and years studying the target language. Data were collected using an adapted version of Schmitt's (1997) Vocabulary Learning Strategies Questionnaire, comprising 24 individual VLSs. Descriptive statistics identified the most frequently used strategies, while Kruskal–Wallis and Spearman's rank-order correlation analyses examined relationships between the three educational factors and individual VLSs. Participants reported moderate to high use across all strategies. Pronunciation practice, repetition, note-taking, dictionary consultation, contextual analysis, and digital lexical resources were the most frequently used strategies, whereas interaction with native speakers, self-testing, and collaborative vocabulary learning were reported less often. Among the educational variables examined, years studying the target language showed the strongest association with individual VLSs, followed by degree year. Field of study accounted for comparatively little variation. The findings indicate that educational experiences are associated with specific strategic behaviours rather than learners' overall strategic repertoires. Examining individual VLSs also provides a more detailed understanding of how educational pathways relate to vocabulary learning and offers practical guidance for vocabulary instruction that responds to learners' accumulated language-learning experience.

Keywords: Educational Factors, Language-Learning Experience, Multilingualism, Southeast Asia, Vocabulary Learning Strategies (VLSs)

Introduction

Vocabulary Learning Strategies (VLSs) have become a well-established area of research in second and foreign language education. Thus, VLSs help learners regulate and strengthen their lexical development. By selecting appropriate strategies, learners can discover the meanings of unfamiliar words, retain newly acquired vocabulary, retrieve lexical knowledge,

and gradually expand their communicative competence (Nation, 2001; Oxford, 1990). Since vocabulary knowledge is central to language comprehension and production, developing vocabulary is an important part of successful language learning (Cameron, 2001; Nation, 2001; Webb & Nation, 2017). As learners assume greater responsibility for their own learning, the ability to select and adapt VLSs becomes an important component of learner autonomy and long-term lexical development (Oxford & Nyikos, 1989).

Although VLSs are widely recognised as supporting lexical development, learners do not rely on the same strategies to the same extent. Their strategic behaviour evolves in response to both personal characteristics and the environments in which learning takes place (Oxford & Crookall, 1989; Oxford & Nyikos, 1989). For this reason, research has explored numerous variables that may explain variation in strategy use, including demographic characteristics, motivational orientations, linguistic competence, cultural background, cognitive preferences, learning objectives, and multilingual experience (e.g., Çelik, 2007; Gu, 2002, 2003; Lee et al., 2022; Oxford, 1994; Schmitt, 1997). Such findings suggest that VLSs should be viewed as dynamic learning behaviours that develop within specific educational and linguistic environments rather than as stable learner characteristics.

Among the learner- and context-related variables, educational factors have received less attention. Students' degree year, field of study, and previous experience learning the target language may affect their strategic choices by influencing their exposure to language, learning opportunities, and academic demands. As learners move through university, they may change the ways in which they approach vocabulary learning as their academic experience develops (Griffiths, 2003; Tran et al., 2023). These educational factors, however, have received relatively little attention, and conclusions have not been uniformly consistent in various educational settings. This suggests a need for further research into how students' educational experiences may be related to their use of VLSs.

Another issue has to do with the methodological investigation of individual VLSs. Existing studies have tended to categorise strategies into general categories of strategies, which may reveal broad trends of use but may obscure differences between individual strategies. Some strategies may be used on a regular basis, while others within the same category may be used less frequently. Looking at each of these strategies separately may then help to clarify learners' approaches to vocabulary learning. Examining individual strategies may therefore provide a more detailed picture of how educational experience is related to vocabulary learning behaviour. Widely applicable studies that have included multiple educational factors in one analytical framework are not that common, especially in multilingual higher education settings.

The issues are especially significant in Southeast Asia, where university students study multiple languages in various learning programmes and educational settings. This multilingual context provides an opportunity to examine whether students' educational experiences are reflected in their use of individual VLSs. The study was conducted with 668 Bruneian university students studying English as a second language and seven foreign languages. The study investigates the frequency of use of the 24 individual VLSs, as well as whether there are differences in use according to degree year, field of study, and years studying the target language.

The novelty of the present study lies in examining individual VLSs in relation to several educational factors within a multilingual university setting. Looking at the 24 individual strategies, rather than grouping them into broad categories, allows the study to show more clearly how students use different strategies to learn vocabulary. The study also adds to research in the social sciences by looking at whether students' educational background and progress through university are related to their use of specific vocabulary learning strategies. The study, therefore, aims to answer the following research questions:

RQ1: What are the most common vocabulary learning strategies used by university students in Brunei?

RQ2: Do individual vocabulary learning strategies differ in terms of frequency of use according to degree year, field of study, and years of studying the target language?

Literature Review

This section reviews the theoretical and empirical literature relevant to the study. It first introduces the main taxonomies of Vocabulary Learning Strategies (VLSs) and then examines previous research on educational factors related to VLS use. These perspectives form the basis for the present study.

Vocabulary Learning Strategy Taxonomies

Research on second and foreign language learning has given considerable attention to VLSs. Researchers have used somewhat different definitions, but VLSs generally refer to the deliberate actions learners take to learn new vocabulary and manage their own learning (Nation, 2001; Oxford, 1990). These strategies are useful not only for building vocabulary knowledge but also for helping learners become more aware of how they learn and gradually take greater responsibility for their language learning (Cameron, 2001; Oxford & Nyikos, 1989).

Several researchers have proposed different ways of organising VLSs. Oxford (1990) included vocabulary learning in her broader classification of language learning strategies (LLSs), which she divided into direct strategies (memory, cognitive, and compensation) and indirect strategies (metacognitive, affective, and social). Her framework has been widely used in language learning research, although it was developed to describe LLSs more broadly rather than vocabulary learning specifically. However, Nation (2001) presented four processes of vocabulary learning, namely planning, noticing, retrieval, and generating. The framework is based on the mental processes that learners engage in when they are exposed to new words, understand, recall, and apply these words.

Schmitt's (1997) taxonomy is one of the most frequently used frameworks in studying VLSs. Schmitt adapted Oxford's (1990) model; however, he concentrated on vocabulary learning. The scholar conceptualised VLSs into two types: Discovery Strategies and Consolidation Strategies. The first involves dealing with unfamiliar words, and the second involves helping students to remember these words. Determination and Discovery-Social strategies are included in the Discovery Strategies; Consolidation-Social, Memory, Cognitive, and Metacognitive VLSs are covered in Consolidation Strategies. The taxonomy addresses the various phases of the acquisition of a new word, including first sight, determining the meaning of a word, remembering it, and using it. Schmitt's taxonomy has been widely adopted since it addresses multiple facets of vocabulary learning and is a model ready to apply in empirical

research. The taxonomy has additionally been utilised in various educational contexts, with various groups of learners and target languages, making the results easier to compare across studies. Another benefit is that Schmitt's (1997) taxonomy focuses on individual VLSs, enabling researchers to conclude which strategies learners employ more or less often, rather than just relying on overall strategy categories.

The theoretical framework of the present study is based on Schmitt's (1997) taxonomy. The VLS categories are not analysed as grouped units; instead, the study focuses on the 24 individual VLSs that were contained within the adapted questionnaire. Examining strategies separately can reveal differences that may be hidden when they are grouped into broad categories. Strategies within the same category may be used with different frequencies and may not be equally relevant in a particular educational context.

Educational Factors and Vocabulary Learning Strategy Use

Research in this area has considered several learner-related and contextual factors that may be linked to how students use VLSs. These include gender, motivation, language proficiency, multilingual experience, and the educational context in which learning takes place (Gu, 2002; Oxford & Nyikos, 1989; Schmitt, 1997). However, educational factors related to students' academic background and progress have received much less attention. This is despite the possibility that students' academic experience may influence the way they approach vocabulary learning.

Degree year is a factor to consider. As students move into the later stages of their degree, they gain more experience with university study and become increasingly familiar with its academic demands. This experience may also lead them to take greater responsibility for organising and managing their own learning (e.g., Griffiths, 2003). These developments may, in turn, be reflected in the ways students use VLSs. Direct comparisons of VLS use across different university years remain relatively uncommon. Al Fraidan and Fakhli (2024), for instance, found that preparatory-year students and first-year English majors differed in the VLSs they preferred, although the two groups reported using a similar number of strategies overall. The results indicate that students can switch their preferred VLSs during their university studies. Nevertheless, the evidence is still scarce, and the empirical conclusions may be dependent on the educational setting of the learners.

Courses from various academic fields can involve students in various learning activities, terminology, and coursework, potentially affecting the way students learn vocabulary. The academic tasks, language, and teaching methods for students in various disciplines may differ. Such differences could, in turn, affect how they approach vocabulary learning. Gu (2002) found that Chinese university students' academic major had a partial influence on the use of VLSs. Some differences between arts and science students in the use of specific strategies were identified; however, these differences were less marked than those identified between males and females. Gu proposed that academic major could be seen as a component of the broader educational environment and not a key factor determining the manner in which learners employ VLSs. Fan (2020) reported similar disciplinary differences among Chinese EFL learners. For example, arts students were more likely to take notes when consulting dictionaries, and the relationship between guessing strategies and depth of vocabulary knowledge varied according to academic discipline. These findings indicate that students'

field of study may be related to particular VLSs, but its influence on VLS use appears to be limited.

A third educational factor is learners' experience with the target language, which can be measured by the number of years devoted to language learning. Students who spend more time learning a language have more opportunities to encounter new vocabulary, experience different teaching approaches, and use the language in different situations. Over time, this experience may lead them to develop and adjust the ways they learn vocabulary. Research on second language acquisition has also pointed to the importance of continued language exposure for vocabulary development. Segal and Kavé (2024), for example, found that the length of second-language exposure was the strongest predictor of bilinguals' vocabulary knowledge, with a greater contribution than age of acquisition. Their findings also indicate that vocabulary knowledge continues to develop with sustained exposure, rather than being limited to the early stages of learning. Despite this evidence, years studying the target language has received less attention in VLS research. Studies have more often considered learners' academic level than the amount of time they have spent studying a language. Jomaa et al. (2025) found no statistically significant overall differences in VLS use across university levels, although metacognitive strategies showed a slight increase among more advanced students. Al Fraidan and Fakhli (2024) similarly found differences in the VLSs preferred by preparatory-year students and first-year English majors. English-major students reported greater use of metacognitive strategies. Preparatory students relied more on determination strategies. These findings point to a possible link between educational experience and VLS use, but the evidence is still limited and mixed. More specifically, little is known about the relationship between years studying the target language and individual VLSs, especially in multilingual university settings where students may have very different amounts of language-learning experience.

Finally, several gaps remain in the existing literature. Educational factors have been less studied than the demographic and psychological factors, and studies have tended to focus on these factors individually rather than using an integrated analysis. Furthermore, several studies have reported outcomes based on general categories of strategies, and these results may not capture the variability of outcomes for individual VLSs. The present study aims to fill these gaps by studying Bruneian university students' use of 24 individual VLSs with respect to their degree years, fields of study, and years of studying the target language.

Materials and Methods

Participants

The study involved 668 Bruneian university students enrolled in foreign and second language courses at a public university in Brunei Darussalam. Most participants were female (65.6%) and aged 17–22 years (84.9%). Almost all were undergraduate students in bachelor's degree programmes (99.1%), while only a small number were enrolled at diploma or doctoral level. The participants were studying eight target languages: Arabic, English, French, German, Japanese, Korean, Mandarin, and Vietnamese. The largest language groups were English (31.0%), Japanese (20.1%), French (16.6%), and Vietnamese (15.7%). Most students (89.5%) were taking the target language as an elective module, while 10.5% were majoring in the language. The sample was also multilingual, with more than 80% of participants reporting knowledge of at least three languages.

The study examined whether VLS use differed according to students' degree year, field of study, and years studying the target language (RQ2). Detailed information on these three educational factors is provided in Table 1.

Table 1

Educational Profile of the Participants (N = 668).

Variable	Category	n	%
Degree year	1st year	402	60.2
	2nd year	180	26.9
	3rd year	19	2.8
	4th year	59	8.8
	Extension	8	1.2
Field of study	Faculty of Arts and Social Sciences	265	39.7
	Faculty of Science	195	29.2
	Faculty of Integrated Technologies	1	0.1
	School of Digital Science	38	5.7
	School of Business and Economics	92	13.8
	Health Sciences	63	9.4
	Academy of Brunei Studies	14	2.1
Years studying the target language	Less than 1 year	372	55.7
	1–2 years	44	6.6
	3–4 years	22	3.3
	5–6 years	7	1.0
	7–8 years	7	1.0
	9–10 years	16	2.4
	11–15 years	34	5.1
	16–20 years	151	22.6
	More than 20 years	15	2.2

As shown in Table 1, first-year students made up the largest group (60.2%), followed by second-year students (26.9%). Only a small number of participants were in their third or fourth year or enrolled in extension programmes. In terms of field of study, the largest groups were students from Arts and Social Sciences (39.7%) and Science (29.2%), with the remaining participants spread across five other academic disciplines. More than half of the participants (55.7%) had studied the target language for less than one year, while 32.3% had nine or more years of language-learning experience. This shows that the participants differed considerably in their previous experience of learning the target language.

Instrument

Data were collected using an adapted version of Schmitt's (1997) Vocabulary Learning Strategies Questionnaire (VLSQ). The questionnaire included two sections. The first collected demographic and educational information; the second asked participants how often they used individual Vocabulary Learning Strategies (VLSs).

The questionnaire was administered in English and adapted to suit the linguistic and educational context of Bruneian university students. Drawing on previous adaptations of the VLSQ (e.g., Laffey, 2020; Lam & Kuan, 2019; Vo & Jaturapitakkul, 2016; Yip et al., 2021), the wording of some items was simplified, examples were added, and technology-assisted vocabulary learning practices were included. These practices covered the use of online dictionaries, machine translation tools, mobile dictionary applications, and language-learning applications. The final questionnaire contained 24 individual VLSs covering Discovery and Consolidation Strategies (Social, Memory, Cognitive, and Metacognitive). Participants rated how often they used each strategy on a five-point Likert scale, from 1 = *Never used* to 5 = *(Almost) always used*.

Before the main data collection, three specialists in foreign language education reviewed the questionnaire for content validity, clarity, and suitability for the Bruneian higher education context. A pilot study with 12 university students produced satisfactory internal consistency (Cronbach's $\alpha = .820$), indicating good reliability according to DeVellis (1991).

Data Collection

The data for this study were gathered from January to May 2026 (Semester 2) of the 2025/2026 academic year at a public university in Brunei Darussalam. English and foreign language students were invited to participate voluntarily in the study. Consent was obtained prior to completing the questionnaire, and participation was anonymous.

The questionnaire was made available online via *Qualtrics*, and participants spent about 15–20 minutes completing it. In December 2025, the Language Centre Research Ethics Committee granted ethical approval. The research was conducted in accordance with the university's ethical guidelines for research involving human participants.

Data Analysis

The data were analysed using IBM Statistical Package for the Social Sciences (SPSS), Version 20. The internal consistency of the 24-item questionnaire was first assessed using Cronbach's alpha, which yielded a coefficient of .862. The distribution of the data was then checked using the Kolmogorov–Smirnov and Shapiro–Wilk tests. Both tests showed significant departures from normality ($p < .001$), so non-parametric procedures were used for the main analyses.

For the first research question, means and standard deviations were calculated for the 24 individual Vocabulary Learning Strategies (VLSs) to determine their frequency of use. Mean scores were interpreted according to Oxford's (1990) classification: 3.50–5.00 indicated high use, 2.50–3.49 moderate use, and 1.00–2.49 low use.

For the second research question, Kruskal–Wallis tests were used to examine whether individual VLS use differed according to students' degree year, field of study, and years

studying the target language. Spearman's rank-order correlation (ρ) was also used to assess the direction and strength of the relationships between these educational factors and individual VLSs. Only strategies that were statistically significant in both analyses were retained for interpretation. Epsilon squared (ϵ^2) was calculated for each significant Kruskal–Wallis result to estimate effect size, using the formula $\epsilon^2 = (H - k + 1)/(N - k)$, where H is the Kruskal–Wallis statistic, k is the number of groups, and N is the valid sample size. Statistical significance was set at $p < .05$.

Results

Descriptive Statistics of Vocabulary Learning Strategy Use

Table 2 summarises the mean scores, standard deviations, and ranking of the 24 individual VLSs reported by the 668 Bruneian university students. Mean scores ranged from 2.52 to 4.08, indicating moderate to high levels of strategy use across all items. According to Oxford's (1990) classification, 12 strategies were used at a high frequency ($M = 3.50$ – 5.00), while the remaining 12 were used at a moderate frequency ($M = 2.50$ – 3.49). No strategy fell within the low-frequency range ($M = 1.00$ – 2.49).

Table 2

Descriptive statistics and ranking of the individual vocabulary learning strategies (N = 668).

Rank	VLS	Code	M	SD	Level of use
1	I study the sound (pronunciation) of the new word and/or I pronounce it aloud.	CON_MEM_7	4.08	.89	High
2	I say the word repeatedly.	CON_COG_12	3.99	.95	High
3	I take notes in class.	CON_COG_17	3.92	1.05	High
4	I use dictionaries: traditional ones (paper based) and/or an online one (<i>Google Dictionary</i> , <i>Dictionary.com</i> , <i>Reverso</i> , etc.), and/or an online translator (<i>Google Translate</i> , <i>Papago</i> , <i>DeepL Translator</i> , <i>Generative AI</i> , etc.) and/or a smartphone dictionary app.	CON_COG_18	3.89	1.17	High
5	I learn from errors in vocabulary usage that I make.	CON_MET_24	3.80	.94	High
6	I guess the new word from textual context, or from context clues.	CON_COG_16	3.75	1.03	High
	I relate the new word to a similar one in another known language (cognates, similar words; or words with similar sound).	CON_MEM_10		1.04	High
8	I ask classmates and/or other learners of the foreign or second language and/or friends.	DIS_SOC_2	3.68	.96	High
	I relate the new word (form and/or sound) to a similar known word(s) in the same foreign or second language.	CON_COG_11		1.06	High
10	I visualize/analyze the structure (the form) of the new word: its	CON_MEM_8	3.65	1.04	High

	spelling/writing and/or characters and/or construction and/or elements.				
11	I use the grammatical category of the new word (for instance, if it is a noun, a verb, an adjective, etc.) and/or I pay attention to how it is used (its functions; the context/situation in which the word might be used).	CON_MEM_9	3.52	1.01	High
12	I use Foreign/Second-language media (songs, movies, news, newspapers, podcasts, etc.) to study/revise/practice new words.	CON_MET_20	3.52	1.25	High
13	I continue reading, hoping the meaning of the new word will become clear.	CON_MET_23	3.46	1.11	Moderate
14	I write the word repeatedly.	CON_COG_13	3.32	1.15	Moderate
15	I use the new word in sentences and/or within a storyline.	CON_MEM_6	3.24	1.10	Moderate
16	I use the vocabulary section in my textbook and/or word lists and/or a glossary from other sources (other books, paperback, etc.) to study/revise new words.	CON_COG_15	3.20	1.21	Moderate
17	I keep my personal vocabulary notebook to study/revise/practice new words.	CON_COG_14	3.19	1.31	Moderate
18	I continue to study new words over time.	CON_MET_22	3.18	1.04	Moderate
19	I write words together spatially on a page and/or I group them, including the new word.	CON_MEM_5	3.05	1.19	Moderate
20	I ask my teacher (for a translation, a paraphrase, synonym of the word, an example sentence including the word).	DIS_SOC_1	3.01	.96	Moderate
21	I study/revise/practice the new word in a group activity.	CON_SOC_3	2.99	1.15	Moderate
	I use language learning applications (<i>Duolingo</i> , <i>Busuu</i> , <i>Clozemaster</i> , etc.) and/or online language learning contents and/or websites to study/revise/practice new words.	CON_MET_19		1.34	Moderate
23	I test myself with word tests.	CON_MET_21	2.87	1.18	Moderate
24	I interact with native speakers.	CON_SOC_4	2.52	1.14	Moderate

Note. Strategies are ranked in descending order according to their mean scores.

The descriptive findings indicate that the participants reported frequent use of a broad range of VLSs, with a slight predominance of strategies involving pronunciation practice, repetition, note-taking, dictionary consultation, contextual inference, and individual vocabulary processing. The highest-rated strategy was studying the sound or pronunciation of new words and/or pronouncing them aloud (CON_MEM_7), followed by saying the word repeatedly (CON_COG_12), taking notes in class (CON_COG_17), using dictionaries and digital lexical resources (CON_COG_18), and learning from errors in vocabulary use (CON_MET_24). Other

highly used strategies included guessing the meaning of unfamiliar words from context (CON_COG_16), relating new words to known words in another language (CON_MEM_10) or within the target language (CON_COG_11), asking classmates or friends for assistance (DIS_SOC_2), analysing the form of new words (CON_MEM_8), paying attention to grammatical information (CON_MEM_9), and using foreign- or second-language media for vocabulary learning (CON_MET_20).

Conversely, strategies requiring greater learner autonomy, collaboration, or authentic language interaction were generally reported less frequently. The lowest-ranked strategy was interacting with native speakers (CON_SOC_4), followed by testing oneself with word tests (CON_MET_21), using language learning applications and online learning platforms (CON_MET_19), studying vocabulary through group activities (CON_SOC_3), and asking teachers for vocabulary-related assistance (DIS_SOC_1). Other moderately used strategies included keeping a personal vocabulary notebook (CON_COG_14), revising vocabulary over time (CON_MET_22), writing words repeatedly (CON_COG_13), grouping words spatially (CON_MEM_5), using vocabulary lists or glossaries (CON_COG_15), and applying newly learned words in sentences or short narratives (CON_MEM_6).

Educational Factors and Vocabulary Learning Strategy Use

The analyses showed that the three educational factors were associated with individual VLS use to different degrees. Among the three, the number of years studying the target language was associated with the largest number of individual VLSs, followed by degree year, while field of study was associated with fewer strategies. The significant associations were primarily observed in strategies involving vocabulary repetition, note-taking, vocabulary recording, social interaction, and the use of authentic language resources.

Only VLSs that reached statistical significance in both the Kruskal–Wallis and Spearman rank-order correlation analyses were retained for interpretation. Effect sizes are presented as epsilon squared (ϵ^2). See Table 3.

Table 3

Associations between educational factors and significant individual vocabulary learning strategies (N = 668).

Educational factor VLS code		Vocabulary learning strategy	χ^2 (df)	<i>p</i>	ϵ^2
Degree year	DIS_SOC_1	Ask the teacher for vocabulary assistance	12.131 (4)	.016	.012
	CON_SOC_4	Interact with native speakers	28.973 (4)	< .001	.038
	CON_COG_12	Say the word repeatedly	12.055 (4)	.017	.012
	CON_COG_14	Keep a personal vocabulary notebook	16.174 (4)	.003	.018
	CON_COG_15	Use vocabulary lists or glossaries	15.671 (4)	.003	.018
	CON_COG_17	Take notes in class	23.567 (4)	< .001	.030

Educational factor	VLS code	Vocabulary learning strategy	χ^2 (df)	p	ϵ^2
Field of study	CON_MET_20	Use foreign-language media	16.669 (4)	.002	.019
	CON_SOC_4	Interact with native speakers	14.337 (6)	.026	.013
	CON_COG_18	Use dictionaries, online translators and digital lexical resources	16.110 (6)	.013	.015
Years studying the target language	CON_MET_20	Use foreign-language media	15.463 (6)	.017	.014
	DIS_SOC_1	Ask the teacher for vocabulary assistance	35.081 (8)	< .001	.041
	DIS_SOC_2	Ask classmates or friends	15.872 (8)	.044	.012
	CON_SOC_3	Study vocabulary in group activities	20.525 (8)	.009	.019
	CON_SOC_4	Interact with native speakers	71.643 (8)	< .001	.097
	CON_MEM_5	Group words spatially on a page	34.429 (8)	< .001	.040
	CON_MEM_6	Use new words in sentences or storylines	27.024 (8)	.001	.029
	CON_COG_12	Say the word repeatedly	30.600 (8)	< .001	.034
	CON_COG_13	Write the word repeatedly	27.119 (8)	.001	.029
	CON_COG_14	Keep a personal vocabulary notebook	87.547 (8)	< .001	.121
	CON_COG_15	Use vocabulary lists or glossaries	57.340 (8)	< .001	.075
	CON_COG_17	Take notes in class	73.854 (8)	< .001	.101
	CON_MET_20	Use foreign-language media	60.407 (8)	< .001	.080
	CON_MET_21	Test oneself with word tests	16.512 (8)	.036	.013
	CON_MET_23	Continue reading despite unfamiliar vocabulary	21.482 (8)	.006	.021

Degree year was significantly associated with seven individual VLSs. Significant relationships were observed for asking teachers for vocabulary assistance (DIS_SOC_1; $p = .134$, $p = .001$), interacting with native speakers (CON_SOC_4; $p = -.162$, $p < .001$), repeating new words aloud (CON_COG_12; $p = .111$, $p = .004$), maintaining a personal vocabulary notebook (CON_COG_14; $p = .129$, $p = .001$), consulting vocabulary lists or glossaries (CON_COG_15; $p = .129$, $p = .001$), taking notes in class (CON_COG_17; $p = .179$, $p < .001$), and using foreign-language media to support vocabulary learning (CON_MET_20; $p = -.142$, $p < .001$). Effect

sizes ranged from $\epsilon^2 = .012$ to $.038$, indicating that degree year accounted for a modest proportion of the variation in these strategies.

In comparison, field of study exhibited a more limited association with VLS use. Only three strategies were significantly associated with students' academic disciplines: interacting with native speakers (CON_SOC_4; $\rho = -.102$, $p = .009$), using dictionaries, online translators and other digital lexical resources (CON_COG_18; $\rho = -.084$, $p = .031$), and learning vocabulary through foreign-language media (CON_MET_20; $\rho = -.102$, $p = .008$). The corresponding effect sizes ranged from $\epsilon^2 = .013$ to $.016$, suggesting that students' disciplinary backgrounds accounted for only a small proportion of the observed variation.

Among the three educational factors, the years studying the target language demonstrated the strongest association with VLS use, being related to fourteen individual strategies. Significant relationships were identified for social strategies, including asking teachers for vocabulary assistance (DIS_SOC_1; $\rho = -.139$, $p < .001$), asking classmates or friends (DIS_SOC_2; $\rho = -.119$, $p = .002$), participating in group vocabulary learning activities (CON_SOC_3; $\rho = -.110$, $p = .005$), and interacting with native speakers (CON_SOC_4; $\rho = .310$, $p < .001$). Significant associations were also observed for memory strategies, namely grouping words spatially on a page (CON_MEM_5; $\rho = -.187$, $p < .001$) and using new words in sentences or storylines (CON_MEM_6; $\rho = .182$, $p < .001$). Among cognitive strategies, students' experience studying the target language was associated with repeating words aloud (CON_COG_12; $\rho = -.163$, $p < .001$), writing words repeatedly (CON_COG_13; $\rho = -.140$, $p < .001$), maintaining a personal vocabulary notebook (CON_COG_14; $\rho = -.306$, $p < .001$), consulting vocabulary lists or glossaries (CON_COG_15; $\rho = -.256$, $p < .001$), and taking notes in class (CON_COG_17; $\rho = -.304$, $p < .001$). Finally, significant relationships were found for metacognitive strategies, including the use of foreign-language media (CON_MET_20; $\rho = .288$, $p < .001$), self-testing through word tests (CON_MET_21; $\rho = -.082$, $p = .035$), and continuing reading despite encountering unfamiliar vocabulary (CON_MET_23; $\rho = .138$, $p < .001$). Effect sizes ranged from $\epsilon^2 = .012$ to $.122$, representing the largest effects observed among the three educational factors examined.

These findings indicate that the amount of experience learners accumulated while studying the target language was more consistently associated with VLS use than either students' degree year or field of study.

Discussion

This section discusses the findings in relation to previous research, focusing first on learners' patterns of Vocabulary Learning Strategy (VLS) use (RQ1) and then on the educational factors associated with those strategies (RQ2).

How Bruneian University Students Approach Vocabulary Learning

Bruneian university students learning English and seven foreign languages reported moderate to high use of VLSs, with none of the 24 strategies falling into Oxford (1990) low-use category. The results show that students did not depend on a small set of vocabulary-learning techniques. Instead, they reported using a wide range of strategies. Earlier studies have also suggested that learners may benefit from using several VLSs rather than relying on just one approach (Nation, 2001; Schmitt, 1997).

The strategies reported most frequently were practising pronunciation, repeating new words, taking notes, and consulting dictionaries or other digital vocabulary resources. The high frequency of pronunciation and repetition points to learners continuing to use familiar, well-established ways of practising new words. Schmitt (1997) regards repetition as one way of helping learners consolidate new vocabulary. In the meantime, however, Nation (2001) points to the need for repeated exposure to and retrieval of words over time in order for them to be remembered more permanently. Students frequently used dictionary tools and made notes throughout, suggesting that they accessed these VLSs in the discovery stage and also in the consolidation stage. Other digital resources, such as online dictionaries, translation software, and additional online tools, were also utilised, primarily because they offered learners instant access to the meanings of words and further lexical information (O'Neill, 2019).

Students also frequently used strategies that included using contextual clues to make inferences and examining unfamiliar words in more details. Some of these strategies involved using context clues to discern the meaning of a word, examining its form, using grammatical features, and making connections between unfamiliar and familiar words (similarities in meaning, form, and syntactic usage). These approaches move participants to become more active learners with new words, instead of trying to memorise them. Furthermore, the vocabulary-associations can help to improve retention of new words (Nation, 2001; Schmitt, 1997). However, students underscored using social strategies less often. They reported asking classmates for help as a fairly frequent strategy; nevertheless, they also reported interacting with native speakers least frequently. The relative uncommonness of seeking teacher assistance for vocabulary meaning and participating in group vocabulary activities was within the moderate range. This can be attributed to the fact that learners in Brunei do not have many opportunities to practice the target language outside the classroom, especially for foreign languages that are not widely spoken in the country. Under such conditions, students might rely more on self-study and on resources provided in class than on communicative interaction with proficient speakers. Similar trends have also been identified in other foreign language learning settings in which learners have limited opportunities for natural exposure to the target language (Gu, 2003; Schmitt, 1997).

Technology also revealed that there was a distinction between VLSs employed to address immediate vocabulary needs and the strategies used to sustain longer-term learning over time. The most commonly used resources included digital dictionaries and translation tools, whereas language-learning applications and online learning platforms were not used as frequently. This meant that students mostly used technology when they were in need of immediate help with vocabulary, rather than using it as a tool for continued long-term practice. The same trend is seen among university students in Southeast Asian countries, with dictionary-based and technology-driven resources being among the most frequently used VLSs (Colombo et al., 2025; Min et al., 2025).

The results of the study show that Bruneian university students use different strategies for vocabulary learning, including repetition, analytical processing, taking notes, and using digital resources. At the same time, authentic interaction, collaborative learning, vocabulary notebooks, and self-testing remain comparatively underused. These less frequently employed strategies deserve greater attention in classroom practice, as expanding learners' strategic repertoire may support more autonomous and sustained vocabulary development.

How Educational Experiences Shape Vocabulary Learning Strategies

The second research question explored whether VLS use varied according to learners' degree year, field of study, and years studying the target language. The three educational factors were associated with learners' strategic behaviour to different degrees. Among them, years studying the target language showed the broadest pattern of associations, whereas degree year and field of study were linked to a much smaller number of individual VLSs. This pattern suggests that accumulated language-learning experience may be more closely related to learners' strategic behaviour than either academic progression or disciplinary background.

Degree year was associated with seven individual VLSs, mainly involving teacher support, repetition, note-taking, vocabulary recording, and the use of authentic language resources. Although statistically significant, the corresponding effect sizes were small, indicating that progression through university explained only a limited proportion of the observed variation. This interpretation agrees with the limited evidence currently available. For example, Al Fraidan and Fakhli (2024) also found differences in learners' preferred VLSs across educational stages, although the differences concerned specific strategy preferences and were accompanied by little variation in overall strategy use. Degree year may therefore be related to some aspects of learners' strategic behaviour, but its overall contribution to VLS use appears limited.

Field of study was associated with even fewer differences, with only three individual VLSs showing significant relationships. Gu (2002) similarly found that academic major had only a modest influence on VLS use compared with other learner-related factors. Fan (2020) also noted disciplinary differences in selected strategies, while overall VLS use varied little across disciplines. Chung et al. (2025) reported a similar pattern among Hong Kong university students: some VLSs differed across academic disciplines, but many showed little difference. These studies suggest that students' academic background may be related to particular learning behaviours, but it does not appear to be a major factor in their overall choice of VLSs. A different pattern was found for years studying the target language. Fourteen individual VLSs were significantly related to how long learners had been studying the language, covering social, memory, cognitive, and metacognitive strategies. Most of the effect sizes were small to moderate, but they were consistently larger than those found for the other two educational factors. These findings extend previous research by indicating that prolonged language-learning experience is related not only to vocabulary development itself but also to the selection of specific VLSs. In this respect, they complement the work of Segal and Kavé (2024), who identified sustained language exposure as the strongest predictor of bilinguals' vocabulary knowledge. Looking more closely at the strategies involved reveals a gradual shift in learners' strategic behaviour. Students who had studied the target language for longer relied less on teacher assistance, vocabulary notebooks, and repetitive recording activities. Instead, they made greater use of authentic language resources, contextual learning, and communicative experiences. Rather than indicating the abandonment of particular strategies, these findings may reflect a gradual transition from externally supported and highly structured learning behaviours towards more autonomous, flexible, and contextually integrated approaches to vocabulary learning. Similar developmental tendencies have been discussed in the broader literature on language learning strategies (LLSs), where increasing learning experience has been associated with greater learner autonomy, strategic flexibility, and self-regulation (Griffiths, 2003). More recent evidence likewise highlights self-regulation

as an important mechanism through which learners develop more effective vocabulary learning behaviours (Wang et al., 2025). Although the present cross-sectional design does not permit causal conclusions, the findings suggest that accumulated language-learning experience may play a more influential role in shaping VLS use than educational progression or disciplinary background alone.

The present study highlights that educational influences on VLS use are selective rather than uniform. By examining individual strategies rather than aggregated strategy categories, the findings demonstrate that educational factors are associated with specific learning behaviours instead of shaping learners' strategic repertoires in a generalised manner. Examining individual strategies made it possible to identify relationships that would probably have remained hidden if the analysis had focused only on broader strategy categories. The strongest associations were found for social interaction, repetition, note-taking, vocabulary recording, and the use of authentic language resources. These results show that learners' experience with the target language was related to particular ways of learning vocabulary.

Conclusion

The study investigated the relationship between students' use of Vocabulary Learning Strategies (VLSs) and three educational factors: degree year, field of study, and years of study in the target language. The study focuses on individual VLSs rather than general categories to provide a more in-depth analysis of the relationship between students' educational experiences and the way they learn vocabulary in a multilingual university setting.

The results also provide some practical recommendations for vocabulary teaching. Instructors might teach a variety of strategies rather than each one separately and guide learners to develop an understanding of how and when to use each strategy in different contexts. Greater attention could also be given to strategies that students used less often, including authentic language interaction, collaborative vocabulary learning, self-testing, and regular vocabulary review. These strategies may help support long-term vocabulary development and learner autonomy. The findings also suggest that strategy instruction should take learners' previous experience with the target language into account. As learners gain more experience, classroom support can gradually give way to activities that encourage greater independence and more opportunities to use the language in authentic situations.

The study also adds to previous VLS research by looking at individual strategies. This approach helped show relationships that might not have been noticed when the strategies were grouped into broader categories.

There are also some limitations to consider. The study involved students from only one university in Brunei, and the data were based on what students reported about their own strategy use. Their responses may therefore not always reflect what they actually do when learning vocabulary. Since the study collected data at one point in time, it also cannot show whether students change the way they use VLSs as they gain more experience with the language. Future studies could include students from other universities and educational settings. It would also be useful to follow students over a longer period and combine different types of data to examine how factors such as motivation, language proficiency, and academic achievement relate to VLS use.

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AI Use Declaration

The authors used AI solely for language refinement and stylistic improvement of the manuscript. No AI tools were used for data generation, analysis, or interpretation.

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