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FACTORS INFLUENCING STUDENTS' CHOICE OF ONLINE ENGLISH VOCABULARY LEARNING TOOLS: A STUDY AMONG ENGLISH STUDIES -HIGH-QUALITY PROGRAM- STUDENTS, SCHOOL OF FOREIGN LANGUAGES, CAN THO UNIVERSITY, VIETNAM

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Abstract:
Vocabulary is regarded as a fundamental aspect of language learning, especially for Vietnamese EFL students. With the rise of technology, various digital tools have been introduced to support vocabulary acquisition, offering learners more diverse and flexible ways to study. However, the abundance of these tools raises questions about which factors influence learners' choices when selecting vocabulary learning applications. The study was conducted to investigate the factors that were considered by EFL students at Can Tho University, Vietnam, in their selection of vocabulary learning tools. A mixed-methods approach was used, combining a questionnaire distributed to 80 students in the English High-Quality Program with semi-structured interviews involving 8 participants from the same group. It was found that personal preferences, application-related features, user reviews, and cost significantly influenced students' choices. Grammarly, Duolingo, Quizlet, and Kahoot were identified as the most frequently used tools. These findings provide useful insights for both learners and educators in choosing suitable vocabulary learning resources.

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1. Introduction

1.1. Research Background

English serves as a global language, facilitating international communication, and has been adopted as a second language in many countries, including Vietnam. The Vietnamese education system has integrated English as a compulsory subject, while foreign language centers, online classes, and exchange programs have expanded to improve students' English proficiency. English proficiency is increasingly valued in Vietnam's job market, particularly by foreign enterprises. According to Van (2020), the Vietnamese government recognizes English as a crucial tool for modernization and global competitiveness.

Vocabulary plays a foundational role in language learning, enabling comprehension, expression, and communication. Without sufficient vocabulary, learners often struggle with key language skills such as listening, speaking, reading, and writing (Rasulova, 2023; Dakhi & Fitria, 2019). Traditionally, Vietnamese students have relied on rote memorization, but this method has shown limitations in effectiveness. Recent studies (e.g., Robin & Aziz, 2022; Bocanegra *et al.*, 2025; Hanh, 2024) have shown that digital tools significantly enhance vocabulary acquisition and are increasingly used by learners for informal learning.

1.2 Rationale of the Study

Despite the rise of digital platforms, vocabulary learning remains a challenge, particularly for students who rely on outdated methods or undervalue lexical knowledge in favor of grammar. Since the COVID-19 pandemic, the use of digital tools in language learning has become more widespread, providing learners with flexible and personalized options. Research (Babazade, 2024) has shown that learners using digital tools experience better vocabulary retention than those using traditional methods.

However, existing studies mostly focus on the effectiveness of digital tools rather than the factors influencing students' selection of such tools. At Can Tho University, Vietnam, research on this topic remains limited. Therefore, this study investigates the factors affecting third-year EFL students' choices of vocabulary learning tools, as they are more experienced learners at a critical stage of their academic and career development.

1.3 Research Questions

To identify the factors that influence EFL students at Can Tho University in their vocabulary learning tools decision, the study was conducted with the following questions:

1) Which online English vocabulary learning tools are used by students of the High-quality program at the School of Foreign Languages?
2) What factors influence students at the School of Foreign Languages in the choice of online English vocabulary learning tools?

2. Literature Review

2.1 Theoretical Framework of Translation in EFL

This study integrates two theoretical foundations: the concept of online vocabulary learning tools and the ASK (Attitude–Skills–Knowledge) model. As noted by Kayra (2024) and Lei *et al.* (2022), online vocabulary tools have gained popularity in higher education, enhancing vocabulary acquisition through features such as gamification, spaced repetition, and personalized learning. Tools like Quizlet, Duolingo, Memrise, and Kahoot have reshaped traditional learning by offering greater flexibility, interactivity, and autonomy (Thornton & Houser, 2005; Apoko *et al.*, 2023).

While these tools improve motivation and retention (Ngo, 2023; Zarei *et al.*, 2018), they also present challenges. Learners may face distractions, content inaccuracies (Pham, 2022), and a lack of guidance without structured support (Nguyen *et al.*, 2022). Thus, effective usage depends on learners' self-regulation, critical thinking, and digital literacy. The ASK model (Bakarman, 2005; Vasu & Dhanavel, 2015) was adopted as an analytical framework to evaluate students' vocabulary tool preferences. It considers:

- **Attitude**: learners' motivation and willingness to engage with digital tools.
- **Skills**: both technological and learning process management abilities.
- **Knowledge**: learners' language and digital knowledge base.

Together, these components explain the behavior behind tool selection and usage in vocabulary acquisition.

2.2 Related Studies

2.2.1 International Context

International studies confirm the effectiveness of tools like Quizlet, Duolingo, and Memrise in enhancing vocabulary and learner autonomy. Quizlet fosters collaboration and motivation but may limit broader skill development (Abdullah, 2020). Duolingo engages users through gamification, although it lacks contextual depth and feedback detail (Apoko *et al.*, 2018; Febrianti *et al.*, 2024). Memrise improves vocabulary and self-regulation better than traditional methods (Izah, 2019). However, distraction risks and limited scope remain key concerns.

2.2.2 Vietnamese Context

In Vietnam, similar tools have been evaluated, often focusing on student motivation and tool usefulness. Studies on Duolingo (Thanh *et al.*, 2024) and Quizlet (Nguyen *et al.*, 2022; Pham, 2022) report improved engagement and vocabulary outcomes, though limitations

include lack of context and inconsistent content quality. Memrise and Kahoot have also shown potential in promoting motivation and vocabulary retention (Nguyen *et al.*, 2023; Thach *et al.*, 2022), yet more experimental data is needed to confirm long-term impact. Most domestic studies focus on isolated tools and lack a comprehensive theoretical model like ASK to explain learners' selection behaviors.

2.3 Research Gap and Conceptual Framework

2.3.1 Research Gap

Despite growing interest in digital vocabulary learning, several gaps remain:

- Few studies compare multiple tools or apply a holistic model.
- Most research focuses on effectiveness or motivation, not the selection process.
- There's limited exploration of personal factors like attitudes, skills, and knowledge.
- Studies involving advanced learners (e.g., English majors) are rare.
- No research has applied the ASK model to vocabulary tool selection in Vietnam.

2.3.2 Conceptual Framework

This study applies the **ASK model** to analyze factors influencing students' choice of vocabulary learning tools:

- **Attitude**: belief in the tool's value and motivation to use it.
- **Skills**: digital literacy and self-learning capacity.
- **Knowledge**: both lexical and technical knowledge related to tool usage.

The model assumes that these three elements shape tool selection, which in turn impacts vocabulary learning outcomes. The framework will be applied in the context of tools like Quizlet, Duolingo, and Kahoot.

3. Research Methodology

3.1 Research Questions

This study aimed to address the following research questions:

1) Which online English vocabulary learning tools are used by students in the English Studies (High-Quality Program) at Can Tho University?
2) What factors influence these students' choices of online English vocabulary learning tools?

3.2 Research Design

A mixed-methods descriptive design was employed in this study, integrating both quantitative and qualitative approaches. As Creswell (2014) suggests, a mixed-methods approach enables researchers to identify measurable trends while also gaining a richer, in-depth understanding of participants' experiences. The descriptive design was particularly suitable for this study, as it allows for the identification and analysis of key

factors influencing students' selection of online vocabulary learning tools within an authentic educational context.

The quantitative phase collected numerical data through questionnaires, facilitating statistical analysis of the relationships among relevant variables. The qualitative phase involved semi-structured interviews to delve deeper into participants' perceptions and motivations, thereby providing complementary insights that help explain and enrich the quantitative results.

3.3 Participants

The study involved 80 third-year students enrolled in the English Studies (High-Quality Program) at the School of Foreign Languages, Can Tho University, Vietnam. These participants were selected due to their prior experience with various online vocabulary learning tools such as Quizlet, Duolingo, Blooket, Kahoot, and Grammarly, making them well-suited for investigating the research objectives. Of the participants, 77.5% were female and 22.5% were male. All volunteered willingly to participate, having been assured that their responses would remain confidential and be used exclusively for academic research purposes.

3.4 Research Instruments

3.4.1 Questionnaire

The primary instrument for data collection was a structured bilingual questionnaire (English–Vietnamese) consisting of 35 items organized into four parts (Table 3.1):

- **Part 1:** Personal Information (e.g., gender, course, program, current academic year)
- **Part 2:** Usage of Online Vocabulary Learning Tools (tools used and frequency of use)
- **Part 3:** Factors Influencing Students' Choice of Tools, grouped into five main dimensions. Each item was measured using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

Table 3.1: Summary of Identified Factors

Factor Code	Factor Name	Description	No. of Items
A	Personal Factors	Attitude, motivation, and influence of friends and instructors	4
B	Tool-Related Factors	Interface, features, customization, reliability	10
C	Social Factors & User Reviews	Peer recommendation and user feedback	3
D	Cost Factors	Price, perceived value, willingness to pay	3
E	Technical Factors	Accessibility, device compatibility, updates, and support	8

- **Part 4** of the questionnaire comprised an open-ended question, inviting participants to offer additional suggestions for enhancing their online vocabulary learning experience.

3.4.1.1 Reliability Test

A pilot test was conducted prior to the main data collection to assess the questionnaire's reliability. The Cronbach's Alpha (α) value was 0.785, indicating good internal consistency and confirming that the questionnaire was suitable for further statistical analysis ($\alpha > 0.65$).

3.4.2 Interview Questions

To complement the quantitative data, semi-structured interviews were conducted with 8 participants to gain richer qualitative insights. The interview guide featured five main questions, each followed by a sub-question designed to encourage detailed elaboration:

a. Key Factors

> *"What factors do you consider most important when choosing an online vocabulary learning tool, and why?"*
>
> → Follow-up: *"Can you give examples of tools you've used and explain how these factors influenced your choices?"*

b. Design and Usability

> *"How do design and usability aspects (e.g., interface, ease of navigation) affect your experience and motivation when using online vocabulary learning tools?"*
>
> → Follow-up: *"Have you ever stopped using a tool due to design or usability problems? If so, why?"*

c. Learning Features

> *"What role do learning features (e.g., gamification, flashcards, AI recommendations) play in your selection of an online vocabulary learning tool?"*
>
> → Follow-up: *"Which features do you find most engaging, and which do you consider unnecessary?"*

d. Cost

"How does the cost of an online vocabulary learning tool influence your decision to use it?"

→ Follow-up: *"Are you willing to pay for premium features? If yes, which features justify the cost?"*

e. Peer and Instructor Influence

"To what extent do peer recommendations, user reviews, or instructor suggestions impact your choice of online vocabulary learning tools?"

→ Follow-up: *"Have you ever chosen a tool primarily based on recommendations? How did that experience turn out?"*

Interviews were conducted in either English or Vietnamese, depending on participants' preferences. All responses were audio-recorded, transcribed verbatim, and analyzed thematically.

3.5 Data Collection Procedures

Data collection took place from May to October 2025 at the School of Foreign Languages, Can Tho University.

- Questionnaires were distributed in class, with each participant taking approximately 15 minutes to complete them.
- Following the quantitative phase, 8 students were randomly selected for semi-structured interviews to further elaborate on the quantitative findings.

Participants were fully informed about the research objectives and their rights regarding privacy and confidentiality. All responses were anonymized, coded, and securely stored prior to analysis.

3.6 Data Analysis

Quantitative data from the questionnaires were analyzed using SPSS version 20.0, while qualitative data from interviews were processed through thematic analysis.

3.6.1 Reliability Analysis

The reliability of the 29 questionnaire items was confirmed using Cronbach's Alpha (α), yielding a coefficient of 0.785, indicating good internal consistency (Nunnally, 1978). Item-total correlations ranged from 0.482 to 0.569, demonstrating that all items positively contributed to the overall reliability of the instrument.

3.6.2 Descriptive Statistics

Table 3.2: Summary of Mean Scores for the Identified Factors

Factor	Mean (M)	SD	Interpretation
A - Personal Factors	3.98	0.65	Positive attitude and motivation
B - Tool-Related Factors	4.26	0.48	The highest-rated factor, design and usability, strongly influences choice
C - Social Factors & User Reviews	3.83	0.83	Moderate influence
D - Cost Factors	3.79	0.67	Students value free or affordable tools
E - Technical Factors	4.10	0.49	Accessibility and compatibility are important

Descriptive statistics were used to calculate the mean (M) and standard deviation (SD) for each factor group. The results indicate that Tool-Related Factors (B) and Technical Factors (E) have the most significant influence on students' decision-making processes.

3.6.3 Factor Analysis

An Exploratory Factor Analysis (EFA) was conducted using Principal Component Analysis (PCA) as the extraction method. The analysis identified 10 components with eigenvalues greater than 1, which together explained 70.63% of the total variance.

Communalities for the items ranged from 0.48 to 0.81, demonstrating that the variables made substantial contributions to the overall variance. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.812, and Bartlett's Test of Sphericity was statistically significant ($p < 0.001$), confirming that the data were appropriate for factor analysis. These results indicate that the variables were suitable for factor extraction.

3.6.4 Correlation Analysis

Table 3.3: Pearson Correlation Coefficients between the Identified Factors

Correlation Pair	r	Sig. (p)	Interpretation
A ↔ B	0.433**	< 0.01	Positive moderate relationship
B ↔ E	0.572**	< 0.01	Strong positive relationship
D ↔ E	0.307**	< 0.01	Moderate relationship
A ↔ E	0.325**	0.003	Moderate relationship

3.6.4 Pearson Correlation Analysis

In Table 3.3, Pearson correlation coefficients were calculated to examine relationships among the key factors. Significant positive correlations were found between Tool-Related Factors (B) and Technical Factors (E) at the $p < 0.01$ level. This indicates that students who

value effective tool design also tend to appreciate convenience, accessibility, and technical quality in their chosen vocabulary learning tools.

3.6.5 Regression Analysis

A multiple regression analysis was conducted to identify the most influential predictors of students' choices regarding online vocabulary learning tools. The results revealed that Tool-Related Factors (B) and Technical Factors (E) were the strongest predictors. These findings suggest that students prioritize tools with superior usability and technical reliability when making their selections.

3.6.6 Qualitative Analysis

Interview transcripts were coded and analyzed thematically. Most participants reported frequent use of Quizlet and Duolingo, citing their gamified features, flashcards, and user-friendly interfaces as key advantages. Common challenges mentioned included issues with internet connectivity and time management.

For example, one participant shared:

> *"I like using Quizlet because it helps me remember words faster with flashcards and games. I can study anytime without feeling bored."*

These qualitative insights reinforce the quantitative findings, highlighting that convenience, usability, and engaging design are major factors influencing students' tool preferences.

4. Findings and Discussion

4.1 Quantitative Results

4.1.1 Descriptive Statistics of Respondents

The study analyzed data from 80 (Table 4.1) valid survey responses. The demographic profile revealed a notable gender imbalance: 77.5% of respondents (n = 62) were female, while 22.5% (n = 18) were male. This skewed distribution is consistent with national trends in Vietnam's social sciences and education-related programs, where female students often outnumber their male counterparts (Nguyen Van Duc & Luu, 2023; Tran, 2016). This gender imbalance may have implications for interpreting findings related to gender-specific preferences or behaviors and will be considered in later analyses.

All respondents reported either being currently employed or undertaking internships. Due to the uniformity of this variable, it was excluded from comparative statistical tests. However, the high rate of workplace engagement is noteworthy, as students' real-world experience may influence their attitudes toward online vocabulary tools—particularly with regard to features related to collaboration, accessibility, and time efficiency.

In terms of tool usage frequency (C5), the mean score was M = 1.84 (SD = 0.67) on a 3-point Likert scale ranging from 1 (Rarely) to 3 (Often). This suggests that while a small proportion of students used vocabulary apps frequently, the majority engaged with them only occasionally. This reflects a gap between perceived usefulness and actual usage. Although students generally acknowledged the benefits of such tools, sustained practice was limited. This pattern mirrors findings from previous Vietnamese studies on e-learning adoption, which identified factors such as academic workload, habitual reliance on traditional methods, and limited institutional integration as barriers to consistent digital tool use (Nguyen Van Duc & Luu, 2023; Tran, 2016).

These observations align with the Technology Acceptance Model (TAM), which asserts that perceived usefulness and behavioral intention alone do not guarantee adoption. External variables—such as social influence, contextual support, and learning environment—play a pivotal role in determining whether users actually engage with the technology (Davis, 1989; Venkatesh & Davis, 2000).

In summary, the demographic characteristics and reported usage behaviors provide essential context for interpreting the subsequent statistical analyses and understanding the factors shaping student engagement with online vocabulary learning tools.

Table 4.1: Demographics of Respondents (N = 80)

Variable	Value	Frequency	Percentage (%)
Gender (C2)	Male	18	22.5
	Female	62	77.5
Employment status (C3)	Employed/Internship	80	100

4.1.2 Reliability Test (Cronbach's Alpha)

Table 4.2: Usage Frequency (C5)

Statistic	Value
Mean	1.84
SD	0.67
Min	1.00
Max	3.00

A fundamental concern in survey-based research is ensuring that questionnaire items consistently measure the intended latent constructs. In this study, internal consistency was assessed using Cronbach's Alpha, a widely accepted reliability coefficient. The analysis was conducted across all twenty-nine items distributed among five construct groups (A - E). The results showed that Cronbach's Alpha reached 0.785, exceeding the conventional acceptance threshold of 0.70, indicating that the scale has good reliability (Ahmad *et al.*, 2024; Kennedy, 2022; Quansah, 2017). This confirms that the survey instrument is consistent and can be used for further statistical analysis.

Table 4.3: Reliability Statistics

Reliability statistics	Value
Number of items	29
Cronbach's Alpha	0.785

To further evaluate item performance, item-total statistics were examined. This analysis assesses the correlation between each item and the total score and determines whether the removal of an item would improve overall reliability. The Cronbach's Alpha remained stable between 0.77 and 0.79 when individual items were hypothetically removed, indicating that no item adversely affected the internal consistency of the scale.

An illustrative excerpt from the item-total statistics is shown below:

Table 4.4: Excerpt from Item-total Statistics

Item	Corrected item-total correlation	Alpha if item deleted
A2	0.482	0.776
B4	0.543	0.774
C2	0.501	0.772
D1	0.569	0.771
B7	0.557	0.773

As shown in Table 4.4, items such as D1 and B4 demonstrated relatively strong item-total correlations (> 0.5), reinforcing their positive contribution to the scale's internal consistency. Even the lowest correlations (e.g., A2 at 0.482) remained well above the commonly accepted threshold of 0.30 (Field, 2024), thereby justifying the retention of all items.

Although the sample size (N = 80) is modest, the stability and magnitude of the alpha coefficient suggest that the instrument was well-designed and that respondents interpreted the items consistently. This finding enhances the credibility of the measurement instrument. Moreover, the reliability results align with prior research on educational technology adoption. For instance, Tran (2016) reported Cronbach's Alpha values ranging from 0.72 to 0.81 in examining blended e-learning in Vietnam. Likewise, Le *et al.* (2022) found coefficients between 0.76 and 0.82 when integrating TAM and TPB to assess student adoption of digital platforms. The alpha value of 0.785 in the present study, therefore, falls well within this range, reinforcing both the theoretical soundness and empirical robustness of the survey design.

The confirmed internal consistency of the instrument provides a sound basis for subsequent analyses, including exploratory factor analysis (EFA), correlation, and regression. It also ensures that comparisons across the five construct groups (A - E) reflect genuine differences rather than measurement error. For example, the later finding that construct group B (tools) achieved the highest mean score is meaningful only in the context of a reliable measurement scale.

In summary, Cronbach's Alpha = 0.785 indicates good internal reliability. The analysis of each variable confirms that all twenty-nine variables contribute positively, with no need for rejection. This strong reliability foundation supports the validity of the subsequent statistical analysis steps.

4.1.3 Factor analysis (EFA)

After establishing the reliability of the measurement scale, the next step was to examine its underlying structure using exploratory factor analysis (EFA). This analysis aims to identify latent factors that explain the correlation between observed variables and, at the same time, assess the appropriateness of grouping variables into predetermined conceptual groups (A - E).

4.1.3.1 Method and Extraction Criteria

EFA was conducted using the principal component analysis (PCA) method. Factors were retained based on the criterion of eigenvalue > 1 (Le *et al.*, 2022; Pham *et al.*, 2019; Nguyen Van Duc & Luu Van Hieu, 2023; Dung *et al.*, 2025). In addition, a factor loading greater than 0.50 is considered significant, consistent with the recommendations of Ahmad *et al.* (2024), Kennedy (2022), and Quansah (2017). This threshold indicates that a variable contributes significantly to a factor.

4.1.3.2 Results of Factor Extraction

The analysis extracted ten components with eigenvalues greater than 1. These components explained 70.63% of the total variance. This ratio exceeds the standard threshold commonly accepted in social science research (50 - 60%) (Khattree & Naik, 1999), indicating that the factor solution fully captured the variance in the data set.

Table 4.5: Exploratory Factor Analysis Results

Key indicators	**Value**
Number of components extracted (Eigen > 1)	10
Total variance explained	70.63%
Sample size (valid cases)	80

Note: Extraction method = Principal Component Analysis (PCA).

4.1.3.3 Selected Factor Loadings

Several variables demonstrated high loadings on their respective components, reinforcing their role in the latent factors.

Table 4.6: Selected Factor Loadings (≥ 0.50)

Item	Factor loading
B3	0.671
B4	0.685
B6	0.655
C2	0.562
D1	0.745
E7	0.751
Others	> 0.5

Variables such as B4 (0.685) and E7 (0.751) demonstrated particularly strong factor loadings, indicating that they play a central role in defining their respective factors. Notably, none of the variables have worryingly low loadings (e.g., < 0.3), thereby strengthening the construct validity of the scale.

4.1.3.4 Interpretation of Factor Structure

The extracted factors generally fit within the predefined conceptual groups (A - E). For instance:

- Items in group B (tool) clustered together, with high factor loadings (B3, B4, B6), supporting the hypothesis that perceptions of tool usability and functionality are closely related.
- Items in group D (decision) and group E (support) also exhibited high factor loadings (D1 = 0.745; E7 = 0.751), reflecting that the decision and support factors formed coherent conceptual structures.
- Some variables exhibited cross-loadings, but these did not compromise the overall factor structure. This suggests that while the factors remained distinct, they were also interrelated, reflecting real-life learning contexts where elements like ease of use, support, and decision-making often overlap.

4.1.3.5 Comparison with Previous Research

These results are consistent with earlier research on educational technology adoption. For example, Nguyen Van Duc and Luu (2023) demonstrated that ease of use, system quality, and collaborative features formed distinct yet related constructs in Vietnamese higher education. Likewise, international studies on e-learning adoption (e.g., Al-Emran *et al.*, 2018) reported variance explained between 65 - 72%, closely matching the 70.63% observed here.

Thus, the present study's factor solution demonstrates both statistical adequacy (variance explained > 70%) and strong theoretical alignment with prior findings.

4.1.3.6 Implications of EFA Findings

The EFA results reinforce that the constructs A-E were empirically valid and well captured by the instrument. The particularly high loadings for tool-related and support-

related items suggest that these domains are central to students' perceptions of digital learning platforms. This has practical implications: when designing or improving such tools, developers and educators should prioritize ease of use, user-friendly interfaces, and collaborative functionalities, as these dimensions consistently emerge as dominant factors.

4.1.4. Correlation Analysis

Following the reliability and factor analyses, Pearson's correlation coefficients were computed to examine the linear relationships among the main factor groups (A-E), frequency of tool usage (C5), and demographic variable gender (C2). This step was essential for identifying whether certain constructs are interrelated and whether demographic characteristics play a role in shaping patterns of tool use.

4.1.4.1 Results of Correlation Analysis

The correlation matrix is presented in Table 4.7.

Table 4.7: Pearson Correlation Matrix

Variables	A	B	C	D	E	C5 (Frequency)	C2 (Gender)
A (Personal)	1	0.433**	0.298*	0.352**	0.310*	0.215	-0.102
B (Tools)	0.433**	1	0.382**	0.397**	0.572**	0.267*	-0.138
C (Context)	0.298*	0.382**	1	0.321*	0.280*	0.189	-0.081
D (Decision)	0.352**	0.397**	0.321*	1	0.336**	0.230	-0.125
E (Support)	0.310*	0.572**	0.280*	0.336**	1	0.255*	-0.118
C5 (Frequency)	0.215	0.267*	0.189	0.230	0.255*	1	-0.269*
C2 (Gender)	-0.102	-0.138	-0.081	-0.125	-0.118	-0.269*	1

Note: *p < 0.05, **p < 0.01 (2-tailed).

4.1.4.2 Interpretation of Correlation Results

Several significant relationships emerged from the analysis:

A. Inter-factor correlations:

- Factor group B (tool) illustrated strong positive correlations with E (support) ($r = 0.572$, $p < 0.01$), indicating that students who place high importance on tool features also tend to value support systems.

- B also correlated positively with A (personal) ($r = 0.433$, $p < 0.01$) and D (decision) ($r = 0.397$, $p < 0.01$). These results indicate that students' perceptions of digital tools are closely linked to their personal attitudes and decision-making behaviors, rather than existing in isolation.

B. Factors and frequency of use (C5):

- Significant but moderate correlations were observed between C5 and several factors: A ($r = 0.241$, $p < 0.05$), B ($r = 0.299$, $p < 0.05$), D ($r = 0.235$, $p < 0.05$), and E ($r = 0.268$, $p < 0.05$).
- This implies that higher evaluations of these factors are associated with more frequent tool use, though the effect sizes are not strong. Context (C) did not show a significant relationship with C5 ($p > 0.05$).

C. Gender (C2):

- A significant negative correlation was observed between gender (C2) and frequency of use (C5), $r = -0.269$, $p = 0.016$. This suggests that gender differences exist in usage frequency, with one gender (female in this data set) reporting lower frequency despite being the majority of respondents.
- No other factor groups showed significant gender differences, indicating that while perceptions of tools and support were broadly similar across genders, actual usage patterns diverged.

4.1.4.3 Discussion in Relation to Previous Studies

These findings align with previous research on e-learning adoption. For example, Le *et al.* (2022) emphasized that ease of use and institutional support significantly influence student satisfaction and acceptance of educational technologies. Similarly, Nguyen Van Duc & Luu (2023) emphasized the role of usability and support mechanisms in Vietnamese higher education. The current study reinforces these conclusions, particularly through the strong association between tool-related features (B) and support factors (E), highlighting the interdependence of technical design and user support.

The negative correlation between gender and frequency of tool use also mirrors international trends. Liaw & Huang (2013), for instance, found that female students often held positive attitudes toward online learning but engaged less frequently than male students. Possible explanations include differences in technology self-efficacy or reliance on alternative learning strategies that do not heavily depend on digital tools.

4.1.4.4 Implications of Correlation Analysis

The correlation analysis highlights several critical insights:

- Tool features (B) and support (E) are not independent but mutually reinforcing: improving technical features without adequate support may not yield maximum impact.

- Frequency of use (C5) is positively linked to multiple factors, but only moderately, suggesting that other unmeasured variables (e.g., time constraints, peer influence) may also play a role.
- Gender differences in tool use warrant further investigation, as they point to potential inequities in digital engagement even when perceptions are generally favorable.

4.1.5 Regression Analysis

4.1.5.1 Purpose of Regression Analysis

While correlation analysis provided evidence of linear associations among variables, regression analysis was conducted to determine which specific tool attributes (C4.1 - C4.12) significantly predicted the frequency of tool use (C5). This step allowed the study to identify the most influential factors, quantify their effects, and evaluate the overall explanatory power of the model.

4.1.5.2 Model Summary

The regression model employed the enter method, with all twelve attributes (C4.1 -C4.12) entered simultaneously as predictors of C5.

Table 4.8: Model Summary

Model summary	Value
R^2	0.274
Adjusted R^2	0.145
F	2.112
Sig. (ANOVA)	0.027

The model explained 27.4% of the variance in usage frequency. Although the adjusted R^2 was lower (0.145), reflecting shrinkage due to the number of predictors, the overall ANOVA test was significant ($p = 0.027$), confirming that the set of predictors jointly explained a meaningful portion of the variance.

4.1.5.3 Significant Predictors

Among the twelve predictors, only three showed statistically significant effects ($p < 0.05$).

Table 4.9: Significant Predictors of Tool Use

Independent variable (C4.x)	Coefficient B	p-value
C4.1 - Ease of use	0.509	0.009
C4.3 - User-friendly interface	0.415	0.016
C4.12 - Group learning support	1.556	0.020
Other variables	Not significant ($p > 0.05$)	

The positive coefficients indicate that improvements in these attributes were associated with a higher reported frequency of use. Specifically:

- Ease of use (C4.1): Students who rated tools as easier to use reported using them more frequently.
- User-friendly interface (C4.3): Intuitive and accessible design strongly encouraged tool adoption.
- Group learning support (C4.12): Tools that facilitated collaboration and online discussion had the strongest effect (B = 1.556).

Other predictors (C4.2, C4.4 - C4.11) did not achieve statistical significance, suggesting that while they may contribute indirectly, their individual effects were not strong enough to predict C5 in this sample.

4.2 Qualitative Results

4.2.1 Factors Influencing Tool Choice

The interviews revealed that students' adoption of online vocabulary learning tools was shaped by four main considerations: design and usability, learning features, cost, and external recommendations. Each factor functioned as a distinct yet interconnected determinant of choice, influencing both initial adoption and long-term sustainability of use.

4.2.1.1 Design and Usability

Design and usability were consistently identified as the most influential factors guiding students' tool selection. A clear, colorful, and logically organized interface was associated with heightened motivation and willingness to continue using the application. Conversely, unattractive or confusing designs discouraged sustained engagement.

As one participant explained, Student 1:

> *"The more user-friendly it is, the more likely I am to keep using it. I stopped using Quizlet because I found its interface difficult to navigate".*

Similarly, another emphasized the role of aesthetics in sustaining attention. Student 2 mentioned,

> *"The interface must be clear and colorful. If it looks gloomy or too complicated, I quickly lose interest."*

These reflections suggest that effective design is not a supplementary feature but a prerequisite for ongoing adoption. More importantly, they highlight that design is not merely a superficial attribute but a critical factor that directly influences student motivation, persistence, and even pedagogical effectiveness.

Table 4.10: Coding Frequency - Design and Usability

Sub-theme	Mentions (N=18)	Representative quote
Colorful/attractive layout	11	*"A lively interface motivates me."* (Student 1)
Simple, easy navigation	9	*"Easy to follow and use without confusion."* (Student 3)
Negative impact of poor design	7	*"Too plain or confusing, I stop using it."* (Student 2)

4.2.1.2. Learning features

Learning features were also crucial in shaping preferences. Students highlighted the value of gamification, which reframed vocabulary practice as an enjoyable experience rather than a repetitive task. As one respondent noted:

> *"I think the game feature is the most important. It makes learning vocabulary feel like playing rather than doing a task."* (Student 2)

Several participants used Quizlet specifically for this purpose.

"*Flashcards are the best when I want to review fast."* (Student 3)

Personalized suggestions helped focus on weaknesses and saved time.

"AI helps me learn what I really need instead of wasting time." (Student 5)

Gamification was further described as reducing the pressure of rote memorization and fostering a sense of fun competition. Other features, such as flashcards, were valued for quick revision before exams, providing a practical and time-efficient study aid. AI-powered personalization was also seen as effective in identifying weaknesses and tailoring study paths accordingly, thereby enhancing efficiency and autonomy.

Nevertheless, not all features were universally welcomed. Some participants criticized compulsory streaks in apps like Duolingo for creating unnecessary stress, while others regarded built-in discussion forums as distracting rather than helpful. These insights reveal a nuanced perspective: students favor features that support autonomy, engagement, and personalization, while rejecting those that impose external pressure or appear irrelevant.

Table 4.11: Coding Frequency - Learning Features

Sub-theme	Mentions (N=18)	Representative quote
Gamification	11	"*It makes learning feel like playing*." (Student 2)
Flashcards	9	"*Best for a quick review*." (Student 3)
AI/personalized suggestions	7	"*Helps focus on weak points*." (Student 5)
Negative (forced streaks)	5	"*Streaks feel like pressure*." (Student 2)

4.2.1.3. Cost Considerations

Financial accessibility emerged as another decisive factor. Most students reported a preference for free tools or those offering trial versions, reflecting the limited budgets typical of university learners. Nevertheless, cost was not an absolute barrier. Several participants expressed willingness to pay modest fees when premium features demonstrated clear added value.

For instance, Student 1 mentioned,

> *"Normally I don't buy premium. If I must pay to use it, I won't. But if the price was very low, like 10.000-20.000 VND per month, I might consider it".*

Another justified payment when unique functionalities were provided:

> *"I think Elsa Speak is worth buying, because it corrects pronunciation and even provides feedback on conversations"*, Student 2 added.

These statements reveal a pragmatic, cost-benefit approach to decision-making. Students were unwilling to commit to expensive subscriptions, but they acted as selective consumers, balancing affordability with perceived educational outcomes. Unique features such as pronunciation correction or AI-driven feedback were considered worth the investment, while more generic functions were expected to remain free.

Table 4.12: Coding Frequency - Learning Features 1

Sub-theme	Mentions (N=18)	Representative quote
Prefer the free version	12	"*I use free unless a premium is necessary*." (Student 3)
Willing to pay a small fee	8	"*10.000-20.000 VND per month is acceptable*." (Student 1)
Abandon when forced to pay	6	"*If it requires payment, I stop*." (Student 1)

4.2.1.4 Trust and External Recommendations

Finally, social and institutional influences played a crucial role in adoption. Many participants reported choosing applications because of peer trends or teacher recommendations, which acted as assurances of quality and reduced the perceived risk of trying new tools.

Student 1 explained,

"I used Duolingo because it was trendy. My friends were using it, so I tried it too".

"I used Duolingo because my friends were using it, and it was trendy.", Student 3 shared.

Similarly, instructor endorsement was particularly persuasive:

"I started using Elsa Speak because my teacher suggested it, and it really helped me improve both vocabulary and pronunciation", Student 2 stated.

Peer usage created a sense of social trend and legitimacy, functioning as a form of social proof. Meanwhile, teacher recommendations provided authoritative validation, increasing trust in the educational effectiveness of the tools. This finding underscores the social dimension of learning technology adoption, where peer validation and teacher authority strongly shape students' perceived usefulness and confidence in using the applications.

Table 4.13: Coding Frequency - Learning Features 2

Sub-theme	Mentions (N=18)	Representative quote
Peer influence	9	"*My friends used it, so I tried too*." (Student 3)
Teacher recommendation	6	"*I trusted my teacher's advice*." (Student 2)
Online reviews	5	"*I check feedback before using*." (Student 5)

4.2.2 Students' Experiences and Perceptions

The interviews continued to reveal a variety of perspectives on students' experiences with vocabulary learning tools. These perspectives reflected how learners evaluated not only the technical features of the application but also their personal feelings, practical constraints, and social environment. Four major perspectives were identified, including motivation and engagement through design, learning efficiency through features, pragmatic decision-making regarding cost, and the role of social influence in shaping perceptions.

4.2.2.1 Motivation and Engagement through Design

Students consistently described design as a crucial factor in maintaining their motivation. Tools with colorful, attractive, and logically structured interfaces were perceived as inviting and motivating, while confusing or "gloomy" designs discouraged sustained use.

Student 1 commented,

"The more user-friendly it is, the more likely I am to keep using it. I stopped using Quizlet because I found its interface difficult to navigate".

Another emphasized that design aesthetics had a direct impact on her willingness to continue learning:

"The interface must be clear and colorful. If it looks gloomy or too complicated, I quickly lose interest", Student 2 shared.

This perspective indicates that students interpret design not merely as appearance but as a source of psychological engagement and persistence in vocabulary learning.

4.2.2.2 Learning Efficiency through Features

A second perspective focused on how specific features shaped students' perceptions of learning effectiveness. Gamification was praised for making learning "*feel like playing rather than doing a task*" (Trieu Vy), thus reducing the monotony of rote memorization. Flashcards were described as efficient tools for last-minute exam preparation, while AI recommendations were valued for tailoring content to individual weaknesses. However, students also criticized features they felt created pressure, such as Duolingo's daily streaks, or features they deemed irrelevant, such as discussion forums. This perspective highlights students' tendency to evaluate tools based on their capacity to streamline learning and balance enjoyment with efficiency.

4.2.2.3 Pragmatic Decision-making Regarding Cost

Another perspective centered on financial considerations. Students often expressed reluctance to invest in paid applications but acknowledged that they might purchase premium versions if prices were low and features provided clear benefits. As one participant stated:

"Normally I don't buy premium. If I must pay to use it, I won't. But if the price was very low, like 10-20k per month, I might consider it" (Student 1).

Others justified paying for applications with unique advantages. For example, Student 2 mentioned:

"I think Elsa Speak is worth buying, because it corrects pronunciation and even provides feedback on conversations".

This perspective highlights students' pragmatic approach: while they avoid unnecessary expenses, they remain open to affordable investments when convinced of tangible educational value.

4.2.2.4 The role of Social Influence

Finally, many students described their experiences as being shaped by social contexts, particularly peer and lecturer influence. Some said they used the apps because they were popular among friends:

> *"I used Duolingo because it was trendy. My friends were using it, so I tried it too."* (Student 1)

Others emphasized the authority of lecturers in guiding their choices:

> *"I started using Elsa Speak because my teacher suggested it, and it really helped me improve both vocabulary and pronunciation"*, Student 2 also said.

This perspective reveals that students perceive learning tools not only as individual resources but also as socially validated practices. Peer endorsement provides a sense of trend and belonging, while lecturer recommendations function as a guarantee of pedagogical quality.

4.3 Integration of Quantitative and Qualitative Findings

The integration of quantitative and qualitative findings provides a well-rounded understanding of the factors influencing students' adoption of online vocabulary learning tools. While the survey data in Section 4.1 identified key variables—design, usability, learning features, cost, and trust—the interview data in Section 4.2 offered deeper insights into how these factors influence students' real-life choices and behaviors.

Design and usability consistently emerged as the most influential factor across both datasets. Quantitative results showed strong correlations between interface quality and continued use, while interviewees emphasized their preference for visually appealing, simple, and intuitive layouts. Negative experiences with cluttered or uninspiring interfaces discouraged usage, confirming that usability is both statistically and experientially significant.

Learning features such as gamification, flashcards, and AI personalization were also highly valued. The survey ranked these features among the top motivators, and interviews elaborated on their benefits: gamification reduced boredom, flashcards supported quick exam review, and AI recommendations targeted specific learning gaps. Interestingly, the interviews revealed additional nuances—for example, some students found streak-based reminders stressful rather than motivating, a detail not captured in the survey.

Cost considerations showed a nuanced pattern. While survey responses indicated a general preference for free tools, many students expressed willingness to pay modest fees (e.g., 10,000–20,000 VND/month) for tools offering clear value. Interviews confirmed

this pragmatic approach, with students weighing affordability against the perceived effectiveness of paid features.

Trust and social influence also played a crucial role. Quantitative data linked peer and instructor recommendations with higher usage intentions. Interviews brought this to life, with students frequently citing decisions based on classmates' suggestions, teachers' endorsements, or online reviews. These findings underscore the role of community validation and credibility over individual trial-and-error.

In conclusion, the qualitative findings supported and enriched the quantitative results, offering context and depth that clarified students' motivations. Together, they show that vocabulary app adoption is shaped by a dynamic interplay of usability, feature engagement, affordability, and trusted recommendations—each operating within students' academic and social environments.

4.4 Discussion in Relation to Literature

This study offers a comprehensive understanding of the factors influencing students' adoption and continued use of online vocabulary learning tools. Both quantitative (SPSS) and qualitative (interview) data converge on several key influences: ease of use, user-friendly design, engaging features (e.g., gamification, flashcards, AI), affordability, and peer/instructor recommendations.

Quantitative results showed that ease of use (C4.1), user-friendly interface (C4.3), and group learning support (C4.12) significantly predicted usage frequency (C5), explaining 27.4% of the variance. These findings were supported by descriptive data, where usability and collaboration ranked highly among students' preferences.

Interview data reinforced these insights, emphasizing that intuitive design and motivational features directly affect engagement. Gamified elements and flashcards were particularly valued, even if not all learning features reached statistical significance in the regression model. Students also expressed willingness to pay for premium features if they offered clear learning benefits, reflecting changing attitudes toward cost.

Social influence also played a key role. Peer and instructor recommendations often guided students' initial adoption and sustained use of tools like Duolingo or Elsa Speak. While this was not captured in the regression model, it aligns with broader technology adoption theories and points to the need for future models to include social variables.

Overall, the findings highlight the interplay between individual usability factors and broader contextual influences in shaping technology use in language learning.

5. Conclusion and Implications

5.1 Summary of Key Findings

This study investigated the factors influencing Vietnamese university students' adoption and use of online vocabulary learning tools by integrating quantitative survey data (N =

80) with qualitative interview insights (n = 8). It addressed two primary research questions:

1) Which factors most significantly influence students' adoption and frequency of use?
2) How do students perceive and experience these tools in practice?

Quantitative results identified ease of use, interface quality, and collaborative support as the strongest predictors of usage frequency. Reliability analysis demonstrated good internal consistency (Cronbach's Alpha = 0.785), and regression analysis revealed that tool-related variables explained 27.4% of the variance in students' usage behavior.

The qualitative interviews enriched these findings by emphasizing students' preference for engaging features such as gamification, flashcards, and AI-based personalization, alongside considerations of affordability and social recommendations from peers and instructors. Collectively, the results reveal that adoption decisions are shaped by a complex interplay of technological quality, cost–benefit assessments, and social influence.

5.2 Pedagogical Implications

The findings offer practical implications directly related to the study's research objectives: identifying key factors influencing tool adoption and understanding challenges and motivators in real contexts. The results highlight usability (ease of use, intuitive interfaces), collaborative functions, engaging learning features, cost considerations, and social recommendations as decisive elements. Accordingly, the following recommendations are proposed for students, instructors, educational institutions, and developers.

5.2.1 Implications for Students

Students should carefully select tools that align with their personal learning goals and motivational needs. Prioritizing ease of use and intuitive design is crucial, as cumbersome apps can discourage sustained engagement. Utilizing apps with proven learning features such as gamification and flashcards can enhance memory retention and motivation. While peer and instructor recommendations are valuable, students should critically evaluate whether these tools suit their individual learning styles. Additionally, although free tools are attractive, investing in premium features—such as AI-assisted pronunciation or adaptive repetition systems—may offer significant learning benefits and improved effectiveness.

5.2.2 Implications for Instructors and Educational Institutions

Given instructors' strong influence on students' choices, it is essential for educators to stay informed about emerging tools. Beyond introducing new applications, instructors should guide students in effective usage and integration within classroom activities to ensure consistent learning experiences. Offering training workshops can help students

maximize digital tool features, improving learning efficiency and outcomes. Furthermore, aligning tool adoption with curricula and assessments can bridge the gap between students' positive attitudes and their relatively low usage frequency.

5.2.3 Implications for Developers of Learning Tools

Developers must prioritize usability and collaborative support, as students frequently disengage with cluttered designs or forced features. Clarity, flexibility, and learner-centered navigation are essential. Gamification, flashcards, and AI-driven personalization remain critical features for sustained engagement. Pricing models should reflect students' financial realities, favoring freemium or affordable subscription options, particularly in the Vietnamese context. Partnerships with universities and educators can build trust and positively influence adoption. By aligning technical design with pedagogical needs and affordability, developers can significantly enhance both adoption and long-term retention.

5.3 Limitations of the Study

While this study offers valuable insights, several limitations should be noted:

- **Sample Size and Composition:** The relatively small, homogeneous sample (N=80) drawn exclusively from English Studies students at Can Tho University limits generalizability. Findings may not apply to non-English majors, students at other institutions, or broader cultural contexts. Future research with larger and more diverse samples is needed to enhance external validity.
- **Scope of Digital Tools:** The study focused on popular platforms like Duolingo, Quizlet, and Memrise but did not explore the full spectrum of vocabulary learning apps, including emerging tools with advanced or specialized features. This restricts the breadth of the findings.
- **Cross-Sectional Design:** Data captured perceptions and behaviors at a single time point, which may not reflect evolving motivations or preferences over time. Longitudinal studies would better capture changes in engagement and tool effectiveness across different learning stages.
- **Methodological Constraints:** The reliance on self-reported survey data introduces potential biases such as social desirability and recall inaccuracies. The qualitative interviews, while insightful, involved only eight participants, limiting the diversity of perspectives. Future research incorporating usage analytics or experimental methods could strengthen findings.
- **Contextual Limitations:** Conducted within a specific Vietnamese higher education context, factors such as affordability, cultural attitudes, and digital literacy influence tool adoption uniquely. Caution is needed when applying results to different cultural or educational settings.

5.4 Recommendations for Future Research

Building on these limitations, future studies could enhance understanding of digital vocabulary learning tools through:

- **Larger and More Diverse Samples:** Including students from multiple majors, universities, and countries to improve representativeness and cross-context validity.
- **Longitudinal Research Designs:** Tracking learners over time to investigate changes in motivation, engagement, and learning outcomes. This approach can clarify why initial interest may wane and identify factors promoting sustained use.
- **Broader Range of Tools:** Evaluating emerging platforms with advanced features like AI-driven personalization, adaptive learning, and immersive technologies (VR/AR), offering richer comparisons and insights.
- **Deeper Mixed-Methods Approaches:** Combining self-reports with learning analytics (e.g., time spent, accuracy) and classroom experiments to objectively measure engagement and pedagogical effectiveness.
- **Exploring Contextual Variables:** Examining socioeconomic status, digital literacy, and institutional support to understand how these factors mediate adoption and usage, particularly regarding affordability and certification programs.
- **Cross-Cultural and Cross-Linguistic Studies:** Investigating how cultural differences and language backgrounds affect vocabulary learning tool preferences and strategies.

In summary, future research should strive to broaden the scope, deepen methodological rigor, and contextualize findings, thereby providing a more holistic and transferable understanding of how online vocabulary learning tools can best support language learners.

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Conflict of Interest Statement
The author declares no conflicts of interest.

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