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Vocabulary Learning Strategies Used by EFL Undergraduate Students at Karabük University

Khalefa Kheder

Department of English Language, Idlib University, Syrian Arab Republic
Email: khalefakhedir@gmail.com, khalefa_kheder@idlib-university.com

ABSTRACT

Learning English in general, particularly vocabulary has attracted the interest of lots of studies. However, limited studies have been conducted on vocabulary learning strategies in the Turkish context. Therefore, the current study aims to examine the patterns of vocabulary learning strategies (VLSs) used by EFL undergraduate students at Karabuk University. The study used quantitative research design, including descriptive statistical analyses. The respondents of this study are undergraduate students from 3 departments: English Language and Literature, Electric-Electronic Engineering, and Computer Engineering at Karabuk University. The research instrument used is a questionnaire adopted from Schmitt's (1997) taxonomy for learning vocabulary. The sample of the study includes 206 male and female respondents during the first semester of the academic year 2021–2022. The findings indicate that the respondents used a moderate range of strategies. More specifically, the findings reveal that "Ask classmates for meaning", "Study the word with a pictorial representation of its meaning", "Associate the word with its coordinates", "Verbal repetition" and "Keep vocabulary notebook" strategies are highly used. The findings also show that male undergraduate students used all VLSs at a higher percentage than their female counterparts. Consequently, it is expected that the outcomes of this study will reflect on the teaching and learning processes in which instructors could employ the best VLSs to assist learners in learning vocabulary, and learners could become familiar with the strategies that suit them best.

Keywords: vocabulary learning strategies, EFL undergraduate students, L1, gender, proficiency level, academic major, Schmitt's Taxonomy

1. INTRODUCTION

Vocabulary is the most important factor of language competency; without it, meaningful communication and conveying the desired meaning are unattainable. Therefore, the study of vocabulary is crucial in the mastery of English by students who are interested in learning languages (Ajisoko, 2020). Students are engaged in sufficient vocabulary learning, as this will increase their learning of other skills and languages with ease. In this regard, learning vocabulary is one of the keys to learning a language, as it finds its roots in learning various languages. If a foreigner within a new environment decides to learn the language of the environment without properly learning the vocabulary of that environment, the foreigner will find it difficult in understanding the language (Puspita & Sabiqoh, 2017). Thus, vocabulary learning is very important to any student who cares about learning a new language or skills. Vocabulary learning strategies include knowledge about the procedures used by learners to learn new and unfamiliar vocabulary, as well as actions and steps they take to find the meaning of unknown vocabulary. Language learning strategies are important because they assist learners in organizing their learning, attaining independence, practicing learning outside of the classroom, and improving communication competencies (Elashhab, 2019). Vocabulary is fundamental in language learning, and the more vocabulary a learner knows, the more comprehension and understanding he or she will gain from a lesson. For academic achievement, learners require a wide range of independent vocabulary (Lateh, 2018). This is impossible to do without the use of learning strategies. Vocabulary learning strategies require learners to efficiently consider the relationships among terms, their meanings, and how to use these terms in a variety of contexts (Hyland & Tse, 2007; Alqarni, 2018). According to Wilkins (1972), "Without grammar, very little could be expressed; without vocabulary, nothing could be expressed," i.e., learners are incapable of holding a conversation efficiently if they are only capable of recognizing the syntax and morphology of a word apart from its meaning. Thus, the learning of vocabulary is an important indicator of success in learning a foreign language. Even though this concept is well-known, it has not been given sufficient attention in the teaching of English as a foreign language, with a greater focus on grammar. Folse (2004) notes that since learning a foreign language or second language entails vocabulary knowledge, syntax, pronunciation, morphology, and reading, vocabulary has been ignored in language teaching while being "the most imperative element in languages." Richards (1976) states that "the learning and teaching of vocabulary have never captured the same level of attention within language teaching as such topics as grammar, writing, and reading". Researchers such as Smith (2008) consider that learners with a large number of words have a higher chance of learning other languages than those with a restricted vocabulary.

Several studies (Schmitt, 1997; Jackson & Amvela, 2000; Prevost, 2010; Yang, 2010) have found that the vocabulary subject has received less attention in comparison to other elements of foreign language learning like reading, writing, listening, and speaking. According to Hedge (2000), the main reason

for the lack of emphasis on vocabulary learning research is the lack of attention paid by learners themselves. Language teachers have devoted great emphasis to recent improvements in English grammar. Although there have been several prior studies on VLSs dating back to the 1970s, it has been challenging to determine which strategy is the best to use (Goundar, 2019). Learners face several challenges in recalling the words required to accomplish the communication process efficiently, revealing the significance of vocabulary learning strategies that assist the learners in dealing with these challenges by allowing them to keep the words and retrieve them from memory once they are required in communication. These difficulties encountered by university EFL students are related to a failure to use appropriate strategies for acquiring and retaining vocabulary once needed (Alhaysony, 2017).

Though some studies have been conducted on VLSs, very few have been carried out on VLSs employed by students from different disciplines and fields. The majority of EFL studies have concentrated on the common learning strategies adopted by learners. Furthermore, the studies that have addressed the VLSs have shown inconsistent and contrasting results. As a result, there is a need to bridge these research gaps to provide efficient strategies for vocabulary acquisition at Karabuk University as used by learners. Okyar (2021) suggested that the employment of VLS by male and female learners can be examined by considering several variables, including L2 learning motivation, second-language competency level, and autonomy. Future studies should take into consideration the relationship between EFL learners' employment of VLSs and other factors, including gender and language proficiency Alahmad (2020). Gorgoz and Tican (2020) suggested more research to be carried out on the variables and factors that contribute to male learners' success in vocabulary and learning languages. Ali (2020) suggested that future studies be conducted on VLSs and that male and female participants be included in vocabulary learning and reading contexts. Alhaysony (2017) suggested more studies on the variables and factors that impact strategy selection could be useful. Other studies recommended that more research be carried out within the context of other Turkish universities and institutes. More research in this area should include experimental, descriptive, cross-sectional studies, and multiple samples and methods could as well be adopted in the future (Alhaysony, 2017). Therefore, the main purpose of this study is to examine the patterns of vocabulary learning strategies used by EFL undergraduate students at Karabuk University in Turkey. Therefore, this study aims to address the following research objectives:

1) To determine the levels of vocabulary learning strategies employed by undergraduate students at Karabuk University.
2) To determine the most and least frequent vocabulary learning strategies employed by undergraduate students at Karabuk University.
3) To determine the differences between students' use of vocabulary learning strategies and the independent variables: L1, gender, academic major, and proficiency level.

2. LITERATURE REVIEW

Several academic studies have been carried out on VLS. For instance, Shamsan, Ali, and Hezam (2021) attempted to examine online VLSs utilized by EFL learners during COVID-19 pandemic. The study used a self-administered questionnaire to over 119 respondents, both males and females, with majors in both English and non-English departments. The study utilized descriptive statistics, and the findings revealed that participants of English majors used VLSs more than non-English majors. The respondents indicated that they did not frequently employ strategies such as asking teachers, friends, and classmates. Instead, they utilized Google translation, bilingual dictionaries, or approximated the meaning. This could be attributed to online learning through the Covid-19 outbreak that enhanced self-learning.

Okyar (2021) also conducted a study to determine the VLSs used by Turkish EFL learners and investigate if the employment of VLSs differs by gender. The study employed a quantitative research approach with a total sample of 209 Turkish EFL learners, 108 males and 101 females. The study indicated that VLSs were used at a moderate level. An evaluation of the scale's sub-dimensions revealed that cognitive, memory, and social strategies were employed at a moderate frequency, whereas affective strategies and metacognitive ones were employed at a high frequency. When VLS employment was investigated among both males and females, a noteworthy difference was observed, with female learners achieving a higher overall mean score than their male counterparts. Furthermore, female learners revealed more use of compensation, cognitive, memory, and affective strategies. Nevertheless, there were no statistically remarkable gender differences in the frequency with which social strategies were used. The employment of VLS by male and female learners can be examined in light of several variables including L2 learning motivation, second language competency level, and autonomy.

Besides, Mirioglu (2020) explored the perspectives of eighth-grade EFL students concerning the significance and use of second language VLSs to check the relationship between perceived significance level and VLSs implementation level and to determine the most and least likely preferred VLSs by EFL students through their learning methods. The study used a mixed-method research design. The quantitative data were gained from 398 respondents using a questionnaire depending on Schmitt's taxonomy of VLSs, whereas the qualitative data were gained through focus group interviews involving 45 voluntary participants. The study revealed that EFL students hold a high value on vocabulary learning. It also demonstrated that a substantial strong association exists between VLS significance and implementation level, thereby indicating that students employed the most important strategies on a greater scale. However, the study was limited to 8th - grade students, and lack of balance in the selection of respondents for a gender-balanced study (182 males and 216 females).

Further, Ali (2020) conducted a study to investigate vocabulary learning strategies and the identification of word meanings among Saudi EFL students. The study adopted the quantitative research method through purposive sampling with only 50 male respondents. The analytic and descriptive research instruments were employed. The findings revealed that reading context could be figured out through the meaning of unknown words by guessing words through components strategies. The majority of the respondents depend on the use of online tools, such as translators' applications, online dictionaries, and the Microsoft Word Thesaurus service, where the option to look up words and their meanings could be identified for reading contexts. However, the

study is limited only to male respondents neglecting female respondents in the reading context. The study suggested that both male and female respondents should be included in vocabulary learning and reading context.

In addition, Goundar (2019) conducted a study to examine the employment of several VLSs and investigate the outcomes and challenges of each strategy. A quantitative research design was employed with 53 respondents randomly selected including EFL learners. The study showed that EFL learners frequently employed memorization, repetition, dictionary strategies, translation, experience, and background knowledge to improve their vocabulary. Similarly, Baharudin (2019) conducted a study to determine the patterns of VLS that are often employed amongst ESL undergraduates based on the gender of the learners. The study employed the quantitative approach with descriptive statistics including 40 ESL university students from different majors at a local university, and the data were obtained. The findings revealed that male undergraduate students engage more in vocabulary learning strategies compared with their female counterparts. More specifically, female undergraduates were more frequent in using social and memory strategies in vocabulary learning, whereas male undergraduates used more metacognitive and cognitive strategies.

In the Indonesian context, Mahmud and Nur (2018) investigated male and female learners' learning strategies and discussed them in terms of gender differences. The study was carried out in a high school in Indonesia. A total of 71 respondents were selected randomly from a sample of 250 students employing Slovin formula. A mixed-method research design was used in this study. The quantitative data were obtained through a SILL-created questionnaire, whereas the qualitative data were obtained by interviews. The outcomes arising from the questionnaire revealed that females employ cognitive, and affective strategies, and compensation more than males, whereas males employ metacognitive, social strategies, and memory more often than females. According to the outcomes of the interview, female and male participants adopted varied learning strategies. Thus, such learning strategies were affected by the issue of gender variances in communication.

Table 1. Review of Previous Studies.

Author/s	**Research Design**	**Sampling**	**Data Collections**	**Findings**
Shamsan, Ali, & Hezam (2021)	Quantitative	119 respondents	Questionnaire	Respondents used bilingual dictionaries, Google Translate
Okyar (2021)	Quantitative	209 Turkish EFL students, 108 males and 101 females	Questionnaire	Cognitive, memory, and social strategies were used at a moderate level. Metacognitive were used at a high level.
Ali (2020)	Quantitative	50 male respondents	Questionnaire and Vocabulary tests	Respondents depended on the use of online tools such as translators' applications and online dictionaries.
Baharudin (2019)	Quantitative	40 ESL university students	Questionnaire	Males used more vocabulary learning strategies than female.
Mahmud and Nur (2018)	A mixed-method research design	71 participants were selected randomly	Interviews and Questionnaire	Females employ cognitive, affective strategies, and compensation more than males. Males employ metacognitive, social strategies, and memory more often than females.

Table 1 illustrates the sampling techniques, data collection methods, findings, limitations, and suggestions by various authors. It was noted in the review that the majority of studies employed the simple random sampling method. The simple random sampling in a way guarantees a balanced and unbiased response from randomly picked respondents. Authors who employed balanced sampling tend to achieve an equal share of responsive participants for the survey, and this method is most common when the study tends to find a balance in equal responses from given issues that commonly involve both genders (males and females). Besides, the majority of studies employed the quantitative data collection methods, while a few studies used the qualitative data collection methods. As for the rest of the studies, they used a mixed-method research design. Thus, the various studies used questionnaires and interviews which are the most used means of data collection.

3. RESEARCH METHODOLOGY

3.1. Research Design

The research design is determined by the research problem and the kind of data required. It dictates the entire procedures and requirements for accomplishing the research. In other words, the design is to be described, its strengths and weaknesses are highlighted, and the rationale for the choice of the design needs to be explained (Shuttleworth, 2008). The research design that is adopted needs to be appropriate for any study, either qualitative or quantitative (Cresswell, 2014). Cresswell added that every research study should be guided by a research design, which determines the paradigm and influences the methods used. However, to achieve a successful research design, two factors must be put into consideration. These include the research objectives and questions (Cohen & Manion, 2002). Based on the research objectives in the current study, a quantitative research design was utilized to examine the patterns of vocabulary learning strategies among various learners, especially those who learn English at Karabuk University.

3.2. Theoretical Framework

The purpose of examining VLSs-related literature is to collect relevant data that will assist the researchers in developing a conceptual framework. The purpose of developing a conceptual framework is to outline the current study within the context of prior studies and the perspectives of other researchers. In the current study, the researcher used a collection of variables (e.g., L1, gender, language competency, and academic major). The conceptual framework of the study is shown in Figure 1.

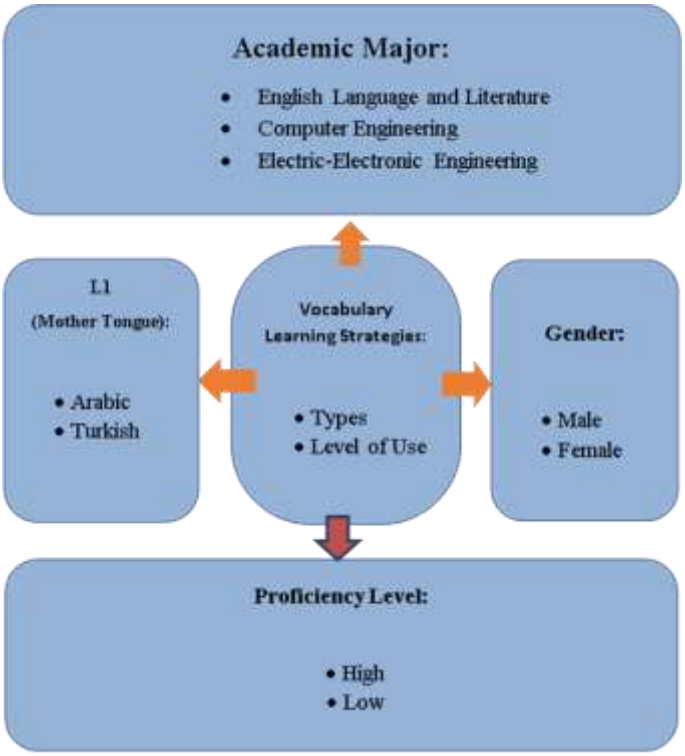

Figure 1. Conceptual Framework of the Study

The recommended conceptual framework in the research study is based on previous research on VLSs.

3.3. Sampling

According to the definition by Howitt and Cramer (2000), the "respondents" are a set of field researchers who are the major subset of the selected population among the entire population size who are purely selected based on the adopted research design employed in the study. Miles and Huberman (1994) noted that it is difficult to cover everything in a research process, regardless of the study, whether quantitative or qualitor when the two are mixed. Furthermore, Bell (1999) emphasizes that sampling approaches should be representative of the entire population as much as possible. According to Cohen and Manion (1994), the selection of a research sample that involves the participants should align with the research objectives of the study and the nature of the targeted population. Therefore, this study selected the respondents from three departments, and the purpose of including these departments is to further investigate the differences between students. Therefore, in this study, the sample size was balanced and managed as suggested by Robinson (1993).

The respondents of this study are undergraduate students from 3 departments: English Language and Literature, Electric-Electronic Engineering, and Computer Engineering at Karabuk University. The sample of the study comprised of 206 male and female respondents during the first semester of the

academic year 2021–2022. The respondents of the main study were 106 males (65%) and 57 females (35%). 70 respondents were Turkish whose mother tongue (L1) is Turkish, whereas 93 respondents were Arabs whose mother tongue (L1) is Arabic.

3.4. Data Collection Methods (Research Instruments)

A quantitative research design method will assist the researchers in determining the respondents' perspectives concerning the VLSs employed by EFL undergraduate students. A questionnaire was adopted in the current study since it was employed in the context of EFL undergraduate learners. The survey study assists researchers in determining individual respondents' viewpoints (Agostini, Talamo, & Vecchione, 2010). The commonly adopted technique often used to examine vocabulary learning strategies based on previous studies include the following: classroom observation, interviews, aloud thinking, taking diaries, and written questionnaires. When there is small population size, oral interviews, diaries, and think-aloud tasks were found to be most appropriate. Using this instrument, it limits the findings of the researcher when there is a larger population (Cohen, 1998). The research instrument used in this study includes a questionnaire adopted from Schmitt's (1997) taxonomy in learning vocabulary.

3.5. Research Instruments

An adopted version of the VLSs questionnaire proposed by Schmitt's (1997) taxonomy was used to answer the research questions. The questionnaire consists of two sections. Section (A) included the demographic information of the respondents, which included the academic major, level, age, gender, and nationality. Section (B) included a 59-item questionnaire that represented the respondents' answers to their vocabulary learning strategies. The 59 items were rated on a 5-point Likert scale (1 = never, 2 = seldom, 3 = sometimes, 4 = often, and 5 = always). The 59 questions were subcategories of the five major classifications of VLSs (determination, social, memory, cognitive, and metacognitive). It is noteworthy to mention that a pilot study was conducted on 43 respondents who were not involved in the main study in order to check the reliability and validity of the questionnaire. The questionnaire was translated into Turkish and Arabic to make it easier for the respondents to answer. It was designed in a Google Format, and the links were sent to the English instructors' group, requesting that they distribute it to their students. The learners were informed that the questionnaire was for research purposes only and it would be completely confidential.

3.6. Data Analysis Methods

According to previous studies, we can deduce that the majority of studies used the SPSS or PLS statistical tool (a software application) for data analyses in various versions. Thus, a descriptive statistical analysis was employed to examine the data gathered from the respondents' questionnaires to determine the frequency and percentage of the strategies. The current study used PLS software application to compute and analyze the data to verify the reliability and accuracy of the internal consistency.

A pilot study was carried out at Karabuk University to determine the viability of all the adopted items in the questionnaire. The adopted questionnaire from Schmitt (1997) was used in the pilot study. Hence, due to COVID-19, the pilot study was conducted online on 43 learners (24 males and 19 females) at Karabuk University in the first semester (December 16-22, 2021) before the main study. The respondents that were targeted in the pilot study are undergraduate and preparatory school students who study their majors in English. The adopted items were employed after showing them to an expert, and some modifications to the demographic information were made. The surveys were distributed to the learners through online Google forms. Following the collection of 43 responses from the respondents, the data were analyzed utilizing the PLS software application, specifically the frequency and mean of the various strategies employed.

3.7 Validity, Reliability and Credibility

In the pilot study, the researcher examined the reliability of the constructs and found that they showed the reliability of the data when using the questionnaire. Reliability has been assessed using the Alpha and the thumb rule is that the values should be greater than 0.70 (Hair, Risher, Sarstedt, & Ringle, 2019). In addition, reliability has also been examined using composite reliability (CR), and the rule of thumb is that the values should be greater than 0.70 (Hair Jr, Howard, & Nitzl, 2020). The results in **Table 2** indicate that Alpha values are higher than 0.70. The findings also showed that the CR values are greater than 0.70, thus showing the significant reliability of the questionnaire and the data collected from these questionnaires.

Table 2. Reliability of the Questionnaire

Constructs	Cronbach's Alpha	Composite Reliability
COG	0.757	0.806
DET	0.747	0.757
MEM	0.900	0.913
MET	0.724	0.821
SOC	0.737	0.809

4. FINDINGS AND DISCUSSIONS

This section addresses the findings of the study. The findings are presented in light of the research questions that are guiding the study. This section also describes and discusses important differences in the frequency of students' employment of vocabulary learning strategies based on L1, gender, academic major, and language competency.

This section reveals the frequency with which VLSs have been used in the five major classifications: Determination (DET), Social (SOC), Memory (MEM), Cognitive (COG), and Metacognitive (MET) strategies.

Table 3, mentioned below, indicates the individual strategy related to vocabulary learning using the determination strategy. The results show the standard deviation and mean values of the individual strategies. In addition, the results expose the percentage used or frequency score of the individual strategy. The results reveal that "Flash Cards" is the only strategy used at a low level (Mean Value = 2.447, Standard Deviation = 1.248, and Percentage of Use = 49.832 percent). In contrast, all the other strategies are used at the medium frequency because the percentage usage of the strategies is not less than 50 percent and not more than 70 percent.

Table 3. Level of Using Determination Strategies (Individual)

Individual Strategy	Mean	Percentage	Std. Deviation	Frequency category
DET1 “I Analyze part of speech”	2.466	51.873	1.224	Medium Use
DET2 “Analyze affixes and roots”	2.534	54.093	1.244	Medium Use
DET3 “Check for L1 cognate”	2.564	58.983	1.181	Medium Use
DET4 “Analyze through available pictures or gestures”	2.632	60.928	1.217	Medium Use
DET5 “Guess meaning from textual context”	2.558	57.763	1.078	Medium Use
DET6 “Use bilingual dictionary”	2.479	52.823	1.119	Medium Use
DET7 “Use monolingual dictionary”	2.577	55.983	1.105	Medium Use
DET8 “Word lists”	2.675	61.262	1.165	Medium Use
DET9 “Flash Cards”	2.447	49.832	1.248	Low Use

Table 4 below indicates the individual strategy related to vocabulary learning using social strategy. This strategy comprises eight individual strategies related to vocabulary learning. The results indicate the standard deviation and mean values along with the percentage used or frequency score of the individual strategy. The outcomes reveal that "Ask classmates for meaning" is the only strategy used at a high level (Mean Value = 3.086, Standard Deviation = 1.173, and Percentage of Use = 71.983 percent). In addition, the results show that "The teacher checks students' flash cards or word lists for accuracy" is the only strategy used at a low level (Mean Value = 2.362, Standard Deviation = 1.164, and Percentage of use = 47.949 percent). In contrast, all of the other strategies were used at the medium frequency because the percentage usage of the strategies was between 50 percent and 70 percent.

Table 4. Level of Using Social Strategies (Individual)

Individual Strategy	Mean	Percentage	Std. Deviation	Frequency category
SOC1 “Ask teacher for L1 translation”	2.773	59.883	1.209	Medium Use
SOC2 “Ask the teacher for paraphrasing or synonym of the new word”	2.834	63.625	1.124	Medium Use
SOC3 “Ask the teacher for a sentence including the new word”	2.773	59.833	1.203	Medium Use
SOC4 “Ask classmates for meaning”	3.086	71.393	1.173	High Use
SOC5 “Discover new meaning through group work activity”	2.718	58.038	1.239	Medium Use
SOC6 “Study and practice meaning in a group”	2.614	55.293	1.151	Medium Use
SOC7 “The teacher checks students flash cards or word lists for accuracy”	2.362	47.949	1.164	Low Use
SOC8 “Interact with native speakers”	2.503	50.031	1.234	Medium Use

Table 5 below indicates the individual strategy related to vocabulary learning using the memory strategy. This strategy comprises twenty-six individual strategies related to vocabulary learning. The results indicate the standard deviation and mean values of the individual strategies. In addition, the results expose the percentage used or frequency score of the individual strategy. The outcomes indicate that "Study the word with a pictorial representation of its meaning" and "Associate the word with its coordinates" strategies are used at a high level (Mean Value = 3.399 and 3.436, Standard Deviation = 1.097 and 1.066, Percentage of Use = 70.573 and 71.833 percent). The results also show that "Use scales for gradable adjectives", "Peg method", and "Group words within a Storyline" are the strategies used at the low level (Mean Value = 2.466, 2.313, and 2.589, Standard Deviation = 1.203, 1.249, and 1.190, and Percentage of Use = 48.837, 45.763, and 49.873 percent). In contrast, all other strategies are used at a medium frequency because their percentage usage is not less than 50 percent nor more than 70 percent.

Table 5. Level of Using Memory Strategies (Individual)

Individual Strategy	Mean	Percentage	Std. Deviation	Frequency category
MEM1 “Connect words to a previous personal experience”	3.203	64.938	1.134	Medium Use
MEM2 “Use semantic maps”	3.209	65.094	1.091	Medium Use
MEM3 “Associate the word with its coordinates (phonetically)”	3.147	62.992	1.061	Medium Use
MEM4 “Connect the word in its synonyms and antonyms”	3.264	67.292	1.110	Medium Use
MEM5 “Image word form”	3.252	66.092	1.214	Medium Use
MEM6 “Image word ‘s meaning”	3.209	65.094	1.209	Medium Use
MEM7 “Use keyword method”	3.092	61.938	1.159	Medium Use
MEM8 “Group words together to study them”	3.117	62.837	1.102	Medium Use
MEM9 “Study the spelling of a word”	2.994	60.938	1.152	
MEM10 “Say the new word aloud when studying”	2.877	59.293	1.154	Medium Use
MEM11 “Use physical actions when learning a word”	3.362	69.476	1.127	Medium Use
MEM12 “Study the word with a pictorial representation of its meaning”	3.399	70.573	1.097	High Use
MEM13 “Associate the word with its coordinates”	3.436	71.833	1.066	High Use
MEM14 “Use scales for gradable adjectives”	2.466	48.837	1.203	Low Use
MEM15 “Peg method”	2.313	45.763	1.249	Low Use
MEM16 “Loci method”	2.724	54.837	1.183	Medium Use
MEM17 “Group words together spatially on a page"	2.656	52.833	1.183	Medium Use
MEM18 “Study the sound of a word”	2.749	56.393	1.224	Medium Use
MEM19 “Group words together within a Storyline”	2.589	49.873	1.190	Low Use
MEM20 “Use new words in sentences”	2.791	57.739	1.119	Medium Use
MEM21 “Underline initial letter of the word”	2.914	60.232	1.124	Medium Use
MEM22 “Configuration”	3.288	67.934	1.159	Medium Use
MEM23 “Affixes and roots (remembering)”	3.301	68.928	1.067	Medium Use
MEM24 “Part of speech (remembering)”	3.356	69.383	1.108	Medium Use
MEM25 “Paraphrase the word ‘s meaning”	2.718	53.434	1.108	Medium Use
MEM26 “Use cognates in the study”	2.902	60.882	1.073	Medium Use

Table 6 below indicates the individual strategy related to vocabulary learning using cognitive strategy. This strategy comprises nine individual strategies related to vocabulary learning. The outcomes reveal that "Verbal repetition" and "Keep a vocabulary notebook" are the strategies used at a high level (Mean Value = 3.203 and 3.295, Standard Deviation = 1.213 and 1.414, and Percentage of Use = 71.920 and 72.920 percent). The findings coincide with

Okyar (2021) and Mirioglu (2020), in which "Verbal repetition" and "Keep a vocabulary notebook" were identified as the most used strategies. The evidence for verbal repetition supports Nation (2001), who indicated that in order to gain proficiency in lexical items, they should be learned sufficiently. In addition, the results show that "Put English labels on physical objects" is the only strategy used at the low level (Mean Value = 2.172, Standard Deviation = 1.235, and the Percentage of Use = 48.928 percent). In contrast, all other strategies are used at a medium frequency because their percentage usage is between 50 percent and 70 percent.

Table 6. Level of Using Cognitive Strategies (Individual)

Individual Strategy	Mean	Percentage	Std. Deviation	Frequency category
COG1 “Verbal repetition”	3.203	71.920	1.213	High Use
COG2 “Written repetition”	3.147	69.022	1.161	Medium Use
COG3 “Word lists”	3.055	67.392	1.244	Medium Use
COG4 “Put English labels on physical objects”	2.172	48.928	1.235	Low Use
COG5 “Keep a vocabulary notebook”	3.295	72.920	1.414	High Use
COG6 “Flashcards”	2.632	54.390	1.361	Medium Use
COG7 “Take notes in class”	3.135	68.839	1.429	Medium Use
COG8 “Use the vocabulary section in your textbook"	3.129	67.389	1.268	Medium Use
COG9 “Listen to the tape of word lists”	2.614	53.202	1.344	Medium Use

Table 7 below indicates the individual strategies related to vocabulary learning using metacognitive strategies. This strategy comprises five individual strategies related to vocabulary learning. The results show the percentage used or frequency score of the individual strategy. The results reveal that "Use spaced words practiced" is the only strategy used at the low level (Mean Value = 2.877, Standard Deviation = 1.328, and Percentage of Use = 49.102 percent). In contrast, all other strategies are used at a medium frequency because their percentage usage is not less than 50 percent nor more than 70 percent.

Table 7. Level of Using Metacognitive Strategies (Individual)

Individual Strategy	Mean	Percentage	Std. Deviation	Frequency category
MET1 “Testing oneself with word lists”	3.104	63.466	1.230	Medium Use
MET2 “Use English language media”	3.018	57.033	1.274	Medium Use
MET3 “Skip or pass new word”	3.295	66.292	1.300	Medium Use
MET4 “Use spaced word practiced”	2.877	49.102	1.328	Low Use
MET5 “Continue to study word over time”	3.362	69.944	1.116	Medium Use

Table 8 indicates that the most used strategies include one strategy from social strategies, two from memory strategies, and two from cognitive strategies, while no high used strategies include determination strategies and metacognitive strategies. "Ask classmates for meaning" strategy is the most used strategy among social strategies (Mean Value = 3.086, Standard Deviation = 1.173, and Percentage of Use = 71.393 percent). In addition, "Study the word with a pictorial representation of its meaning" and "Associate the word with its coordinates" are the most used strategies from memory strategies (Mean Value = 3.399 and 3.436, Standard Deviation = 1.097 and 1.066, and Percentage of Use = 70.573 and 71.833 percent). Finally, "Keep a vocabulary notebook" and "Verbal repetition" are the most used strategies among cognitive strategies (Mean Value = 3.295 and 3.203, Standard Deviation = 1.414 and 1.213, and Percentage of Use = 72.920 and 71.920 percent).

Table 8. Most Used Strategies

Strategies	Item No.	Category	Mean	Percentage	Std. Deviation

"Ask classmates for meaning"	4	SOC	3.086	71.393	1.173
"Study the word with a pictorial representation of its meaning"	12	MEM	3.399	70.573	1.097
"Associate the word with its coordinates"	13	MEM	3.436	71.833	1.066
"Keep a vocabulary notebook"	5	COG	3.295	72.920	1.414
"Verbal repetition"	1	COG	3.203	71.920	1.213

This study also identifies the least used strategies by the students. **Table 9** shows that the least used strategies include one strategy from determination strategies, one strategy from social strategies, three strategies from memory strategies, one strategy from cognitive strategies, and one strategy from metacognitive strategies. More specifically, the "Flashcard" strategy is the least used strategy among the determination strategies (Mean Value = 2.447, Standard Deviation = 1.248, and Percentage of Use = 49.832 percent). Moreover, the "The teacher checks students' flash cards or word lists for accuracy" strategy is the least used strategy among the social strategies (Mean Value = 2.362, Standard Deviation = 1.164, and Percentage of Use = 47.949 percent). Further, "Use scales for gradable adjectives", "Peg method", and "Groups words within a storyline" are the least used strategies from memory strategies (Mean Value = 2.446, 2.313, and 2.589; Standard Deviation = 1.203, 1.249, and 1.190; and Percentage of Use = 48.837, 45.763, and 49.873 percent). Furthermore, "Put English labels on physical objects" is the least used strategy among the cognitive strategies (Mean Value = 2.172, Standard Deviation = 1.235, and Percentage of Use = 48.928 percent). Finally, "Use spaced word practiced" is the least used strategy among the metacognitive strategies (Mean Value = 2.877, Standard Deviation = 1.328, and the percentage use was 49.102 percent). Hence, the hypothesis that vocabulary learning strategies can vary based on learners' L1, gender, academic major, and proficiency level is accepted.

Table 9. Less Used Strategies

Strategies	**Item No.**	**Category**	**Mean**	**Percentage**	**Std. Deviation**
"Flashcard"	9	DET	2.447	49.832	1.248
"The teacher checks students' flashcards or word lists for accuracy"	7	SOC	2.362	47.949	1.164
"Use scales for gradable adjectives"	14	MEM	2.466	48.837	1.203
"Peg method"	15	MEM	2.313	45.763	1.249
"Groups words together within a Storyline"	19	MEM	2.589	49.873	1.190
"Put English labels on physical objects"	4	COG	2.172	48.928	1.235
"Use spaced word practiced"	4	MET	2.877	49.102	1.328

The present study shows the demographic information of the respondents. First, the study indicates the percentage of respondents using Turkish and Arabic as their mother tongues (L1). Only Turkish respondents used the Turkish language as their L1, whereas respondents of other nationalities used Arabic as their L1. Table 10 and Figure 2 indicate that 70 respondents' mother tongue (L1) is Turkish, whereas 93 respondents' mother tongue (L1) is Arabic. This means that 42.9 percent of the respondents used the Turkish language, whereas 57.1 percent of the respondents used the Arabic language.

Table 10. Percentage of Respondents Using Arabic and Turkish Language

	Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Arabic	93	57.1	57.1	57.1
Turkish	70	42.9	42.9	100.0
Total	163	100.0	100.0	

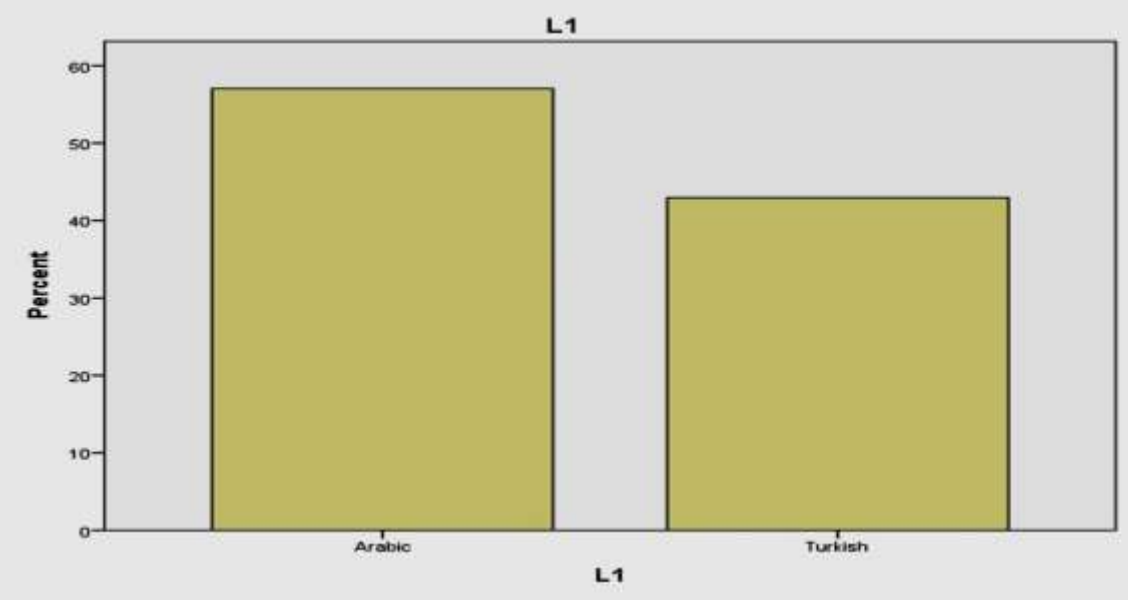

Figure 2. Percentage of Respondents Using Arabic and Turkish Language

The descriptive statistics also include the gender of the respondents. The present study checked the difference between the male and female respondents. **Table 11** and **Figure 3** indicate that 106 of the respondents were males, whereas 57 of the respondents were females. It means 65.0 percent of the respondents are males, whereas 35.0 percent of the respondents are females.

Table 11. Percentage of Respondents According to Gender

	Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Male	106	65.0	65.0	65.0
Female	57	35.0	35.0	100.0
Total	163	100.0	100.0	

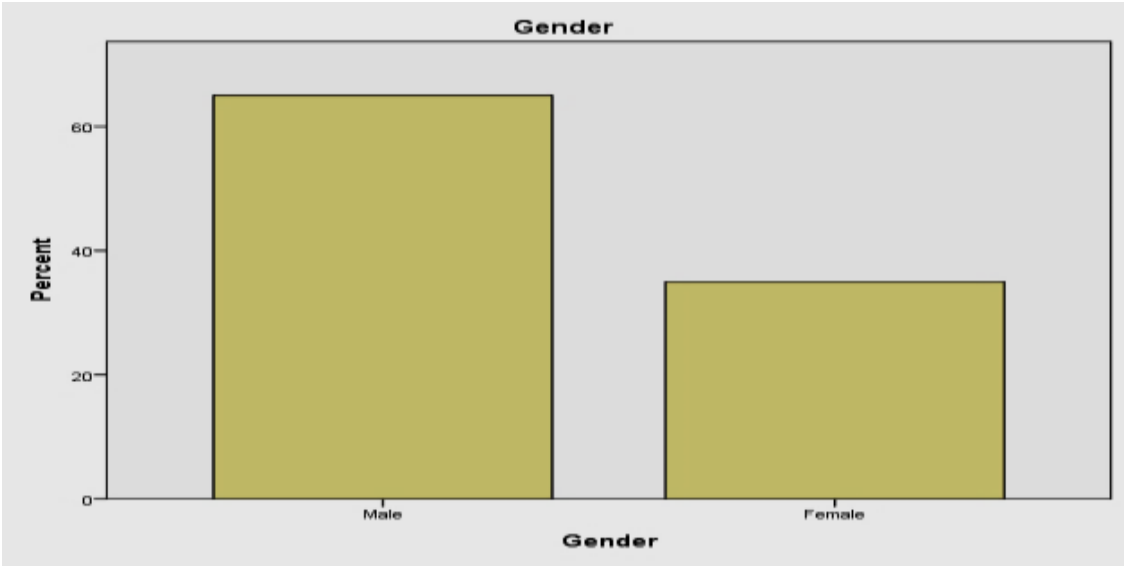

Figure 3. Percentage of Respondents According to Gender

The present study also examined the differences in using vocabulary learning strategies in relation to gender. It shows the usage of determination strategies based on gender. The nature of the usage of strategies is different among males and females. **Figure 4** indicates that male undergraduate students used determination strategies at a higher percentage compared with their female counterparts. The statistics show that the frequency of usage in males was

around 27 percent, whereas in females it was only 12 percent. Thus, these figures show that the frequency of using the determination strategies by males is higher than by females.

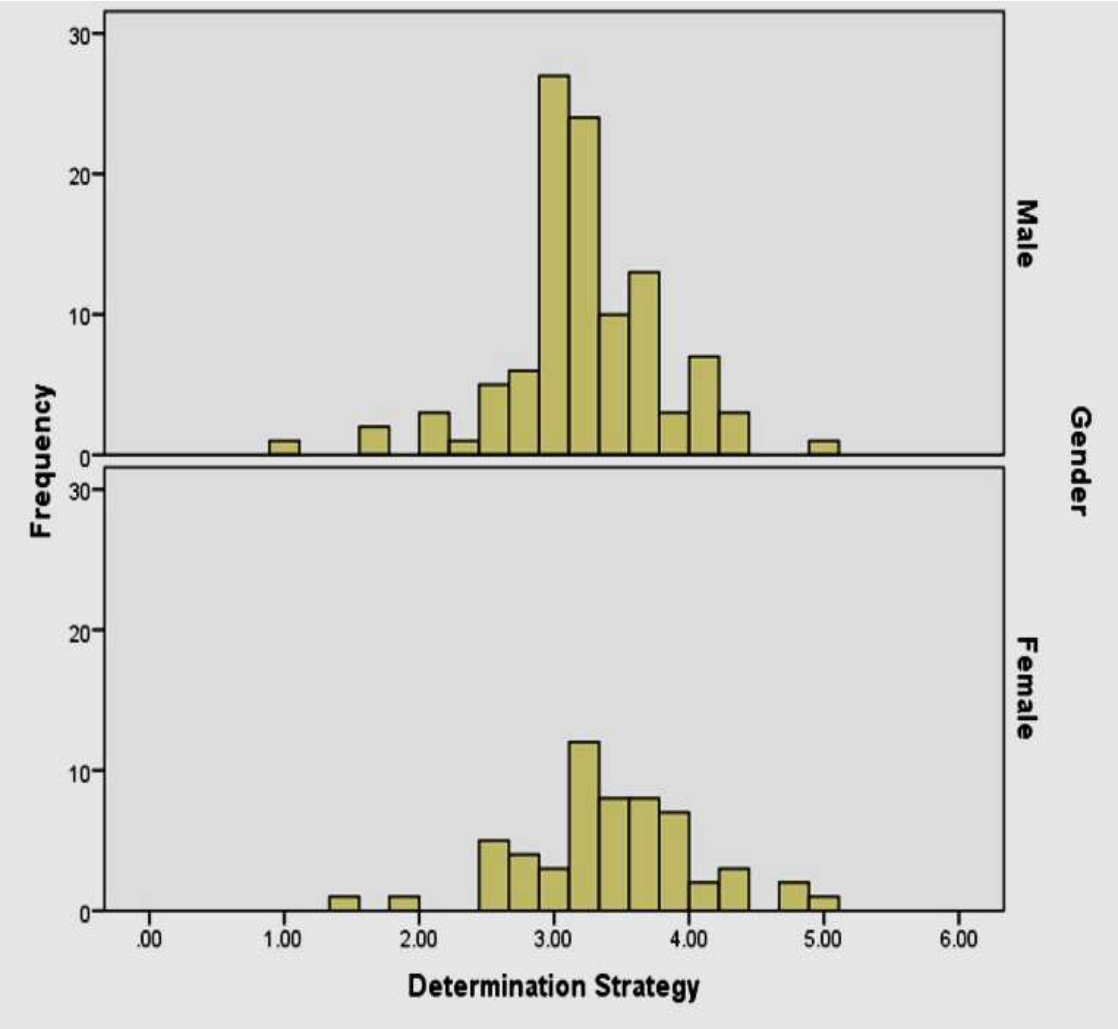

Figure 4. Determination Strategies Used by Male and Female Respondents

The study also mentions the social strategies used with respect to gender because the nature of usage is different among males and females. **Figure 5** indicates that males used more social strategies than females. The figures indicate that the frequency of usage in males is around 17 percent, whereas in females it is only 8 percent. Thus, these figures show that the frequency of using social strategies in males is higher than in females.

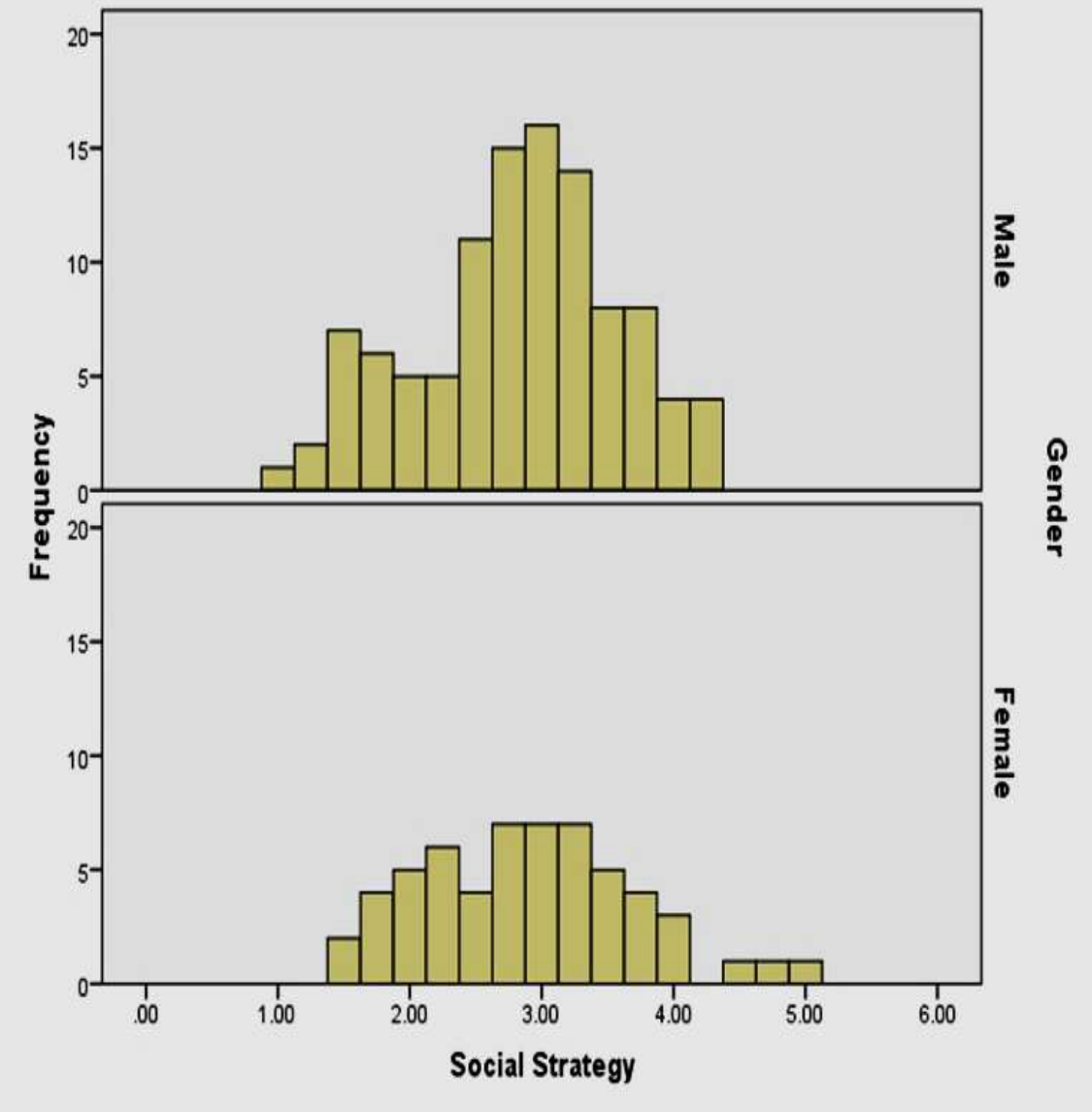

Figure 5. Social Strategies Used by Male and Female Respondents

The respondents also used memory strategies for learning vocabulary and employed them differently. **Figure 6** indicates that the male students used more memory strategies than the female students. The statistics show that approximately 19 percent of male students use memory strategies, whereas the frequency of using memory strategies by females is only 9 percent.

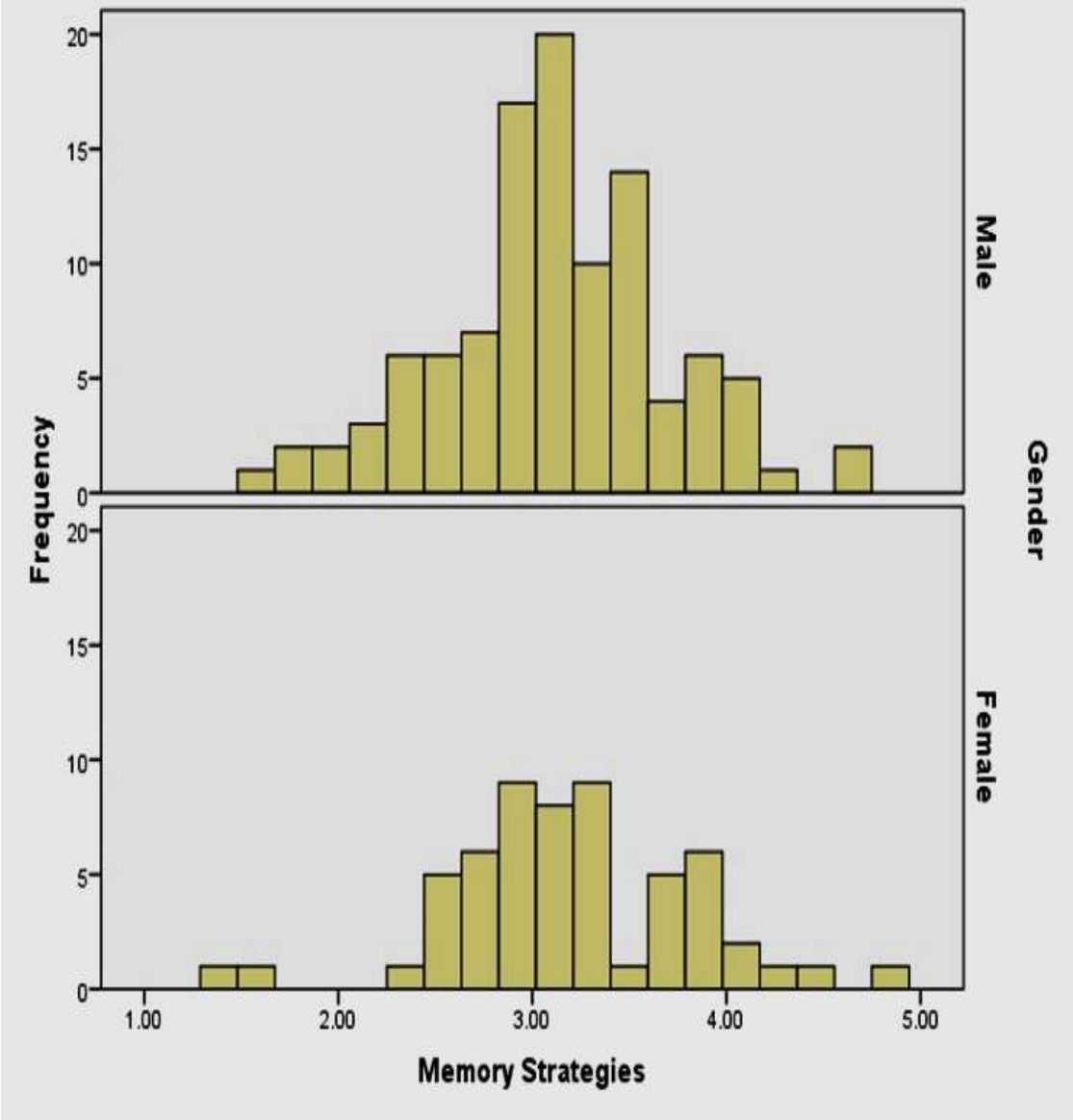

Figure 6. Memory Strategies Used by Male and Female Respondents

The study also shows the usage of cognitive strategies with respect to gender. The nature of the usage of strategies is different among male and female respondents. **Figure 7** indicates that the male respondents use more cognitive strategies compared with the females. The figures indicate that the frequency of usage by males is approximately 18 percent, whereas by females it is only 7 percent. Thus, these figures show that the frequency of using cognitive strategies by males is higher than females.

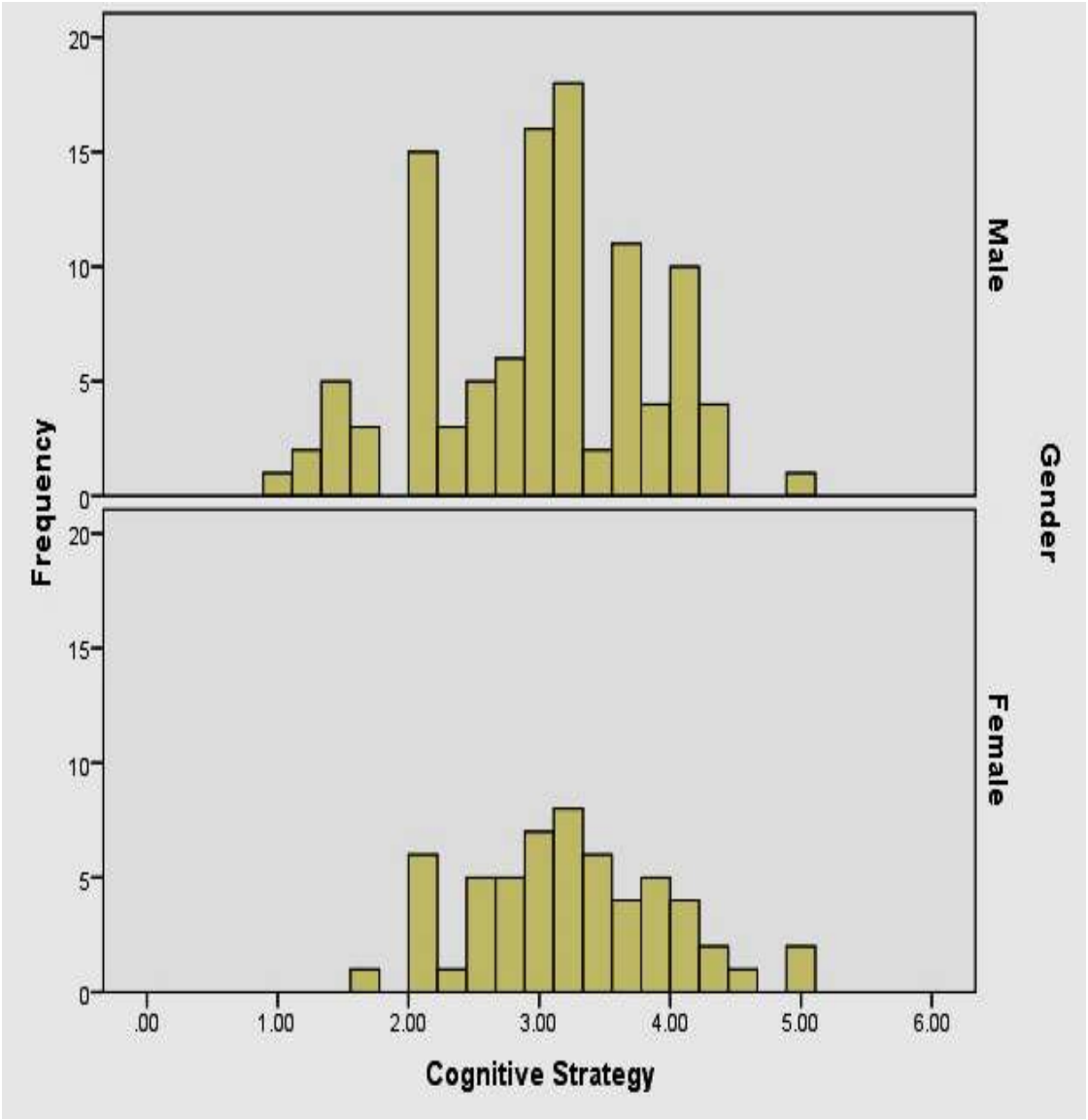

Figure 7. Cognitive Strategies Used by Male and Female Respondents

The students also used metacognitive strategies for learning vocabulary and employed them differently. **Figure 8** indicates that the male students used more metacognitive strategies than the female students. The figures show that approximately 14 percent of male students used metacognitive strategies, whereas the frequency of using metacognitive strategies by female students is only 10 percent.

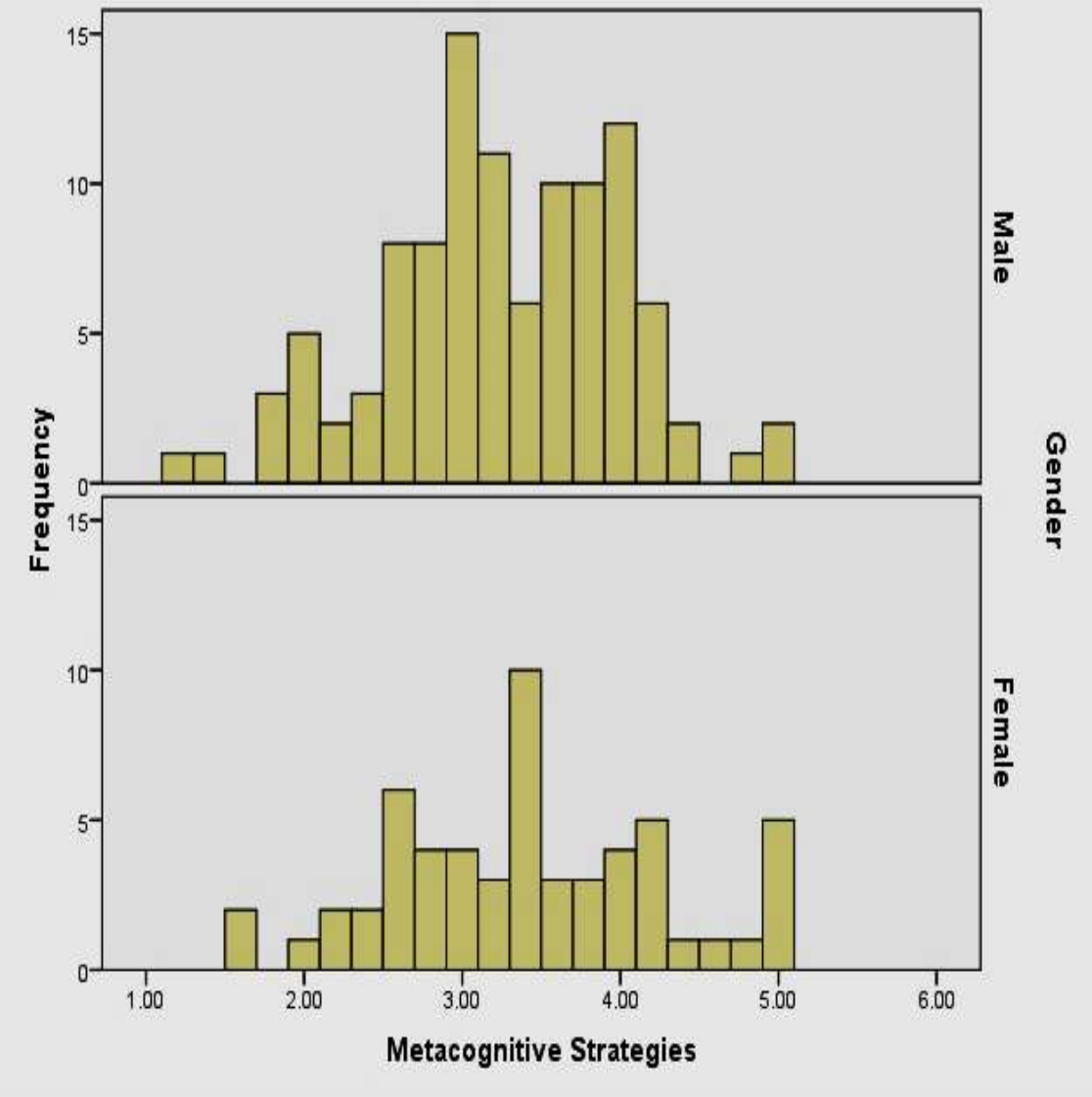

Figure 8. Metacognitive Strategies Used by Male and Female Respondents

The descriptive statistics also show the frequency of using strategies according to the academic majors because the nature of using strategies also differs based on the academic majors. **Table 12** and **Figure 9** indicate that 58 respondents are from the Computer Engineering department, 43 respondents are from the Electrical-Electronics Engineering department, and 62 respondents belong to the English Language and Literature department. Thus, 35.6 percent of the respondents majored in Computer Engineering, 26.4 percent majored in Electrical-Electronics Engineering, and 38.0 percent majored in English Language and Literature. The findings indicate that male undergraduate students use all VLSs at a higher percentage than their female counterparts. Hence, the hypothesis that female students use more strategies than their male counterparts is rejected.

Table 2. Percentage of Respondents According to Academic Major

	Frequency	Percent	Valid Percent	Cumulative Percent
Computer Engineering	58	35.6	35.6	35.6
Electrical and Electronics Engineering	43	26.4	26.4	62.0
English Language and Literature	62	38.0	38.0	100.0
Total	163	100.0	100.0	

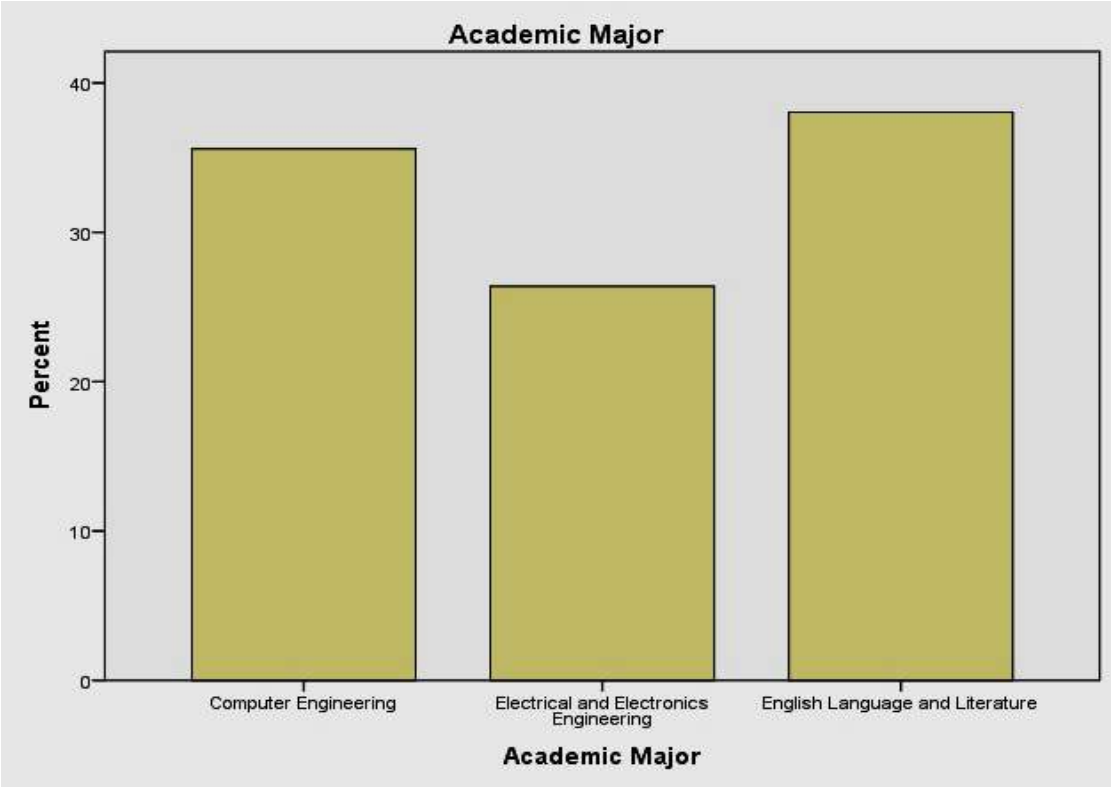

Figure 9. Percentage of Respondents According to Academic Major

The present study investigated the impact of gender on students' use of all strategies. **Table 13** reveals that gender positively impacts the use of determination, cognitive, and metacognitive strategies, whereas it has a negative relationship with the use of social and memory strategies. The t values are greater than 1.96 and the probability values are less than 0.10. It also indicates that gender has a significant association with all the strategies used by the students. Thus, the findings indicate that determination, cognitive, and metacognitive strategies work positively when gender changes, whereas social and memory strategies work negatively when gender changes.

Table 13. Impact of Gender on all Strategies

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	.896	.237		3.774	.000
	Determination Strategy	.151	.073	.194	2.084	.039
	Social Strategy	-.235	.057	-.156	-4.123	.000
	Memory Strategies	-.315	.094	-.243	-3.351	.004
	Cognitive Strategy	.119	.062	.200	1.901	.059
	Metacognitive Strategies	.148	.067	.030	2.209	.029

a. Dependent Variable: Gender

The current study also examined the impact of L1 (mother tongue) on students' use of all strategies. **Table 14** reveals that L1 has a positive impact on social, memory, and metacognitive strategies, whereas L1 has a negative relationship with determination and cognitive strategies. The t values are higher than 1.96 and the probability values are less than 0.05. It also indicates that L1 has a significant association with all the strategies used by the students. Thus, the findings indicate that social, memory, and metacognitive strategies work positively when L1 changes among the students. In contrast, determination and cognitive strategies work negatively when L1 changes among the students.

Table 14. Impact of L1 on all Strategies

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	2.116	.986		2.146	.033
	Determination Strategy	-.742	.302	-.576	-2.457	.013
	Social Strategy	.549	.237	.419	2.316	.016
	Memory Strategies	.787	.392	.518	2.008	.032
	Cognitive Strategy	-.595	.259	-.363	-2.297	.010
	Metacognitive Strategies	.551	.276	.486	1.996	.040

a. Dependent Variable: L1

The present study also examined the impact of the academic major on students' use of all strategies. **Table 15** shows that the academic major has a positive influence on determination and memory strategies, but it has a negative influence on social, cognitive, and metacognitive strategies. The t values are greater than 1.96 and the probability values are less than 0.05. It also indicates that the academic major has a significant association with all the strategies used by the students. Thus, the findings indicate that when the academic major of the students changes, determination, and memory work positively, whereas social, cognitive, and metacognitive strategies work negatively.

Table 15. Impact of Academic Major on all Strategies

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	1.002	.421		2.381	.018
	Determination Strategy	.392	.129	.237	3.039	.023
	Social Strategy	-.306	.101	-.205	-3.029	.025
	Memory Strategies	.396	.167	.273	2.371	.016
	Cognitive Strategy	-.447	.111	-.244	-4.027	.000
	Metacognitive Strategies	-.408	.118	-.292	-3.458	.011

a. Dependent Variable: Academic Major

The current study also examined the impact of proficiency level on all the strategies used by the students. **Table 16** reveals that proficiency level has a positive impact on determination, memory, and metacognitive strategies, whereas the proficiency level has a negative relationship with cognitive and social strategies. The t values are larger than 1.96 and the probability values are less than 0.10. It also indicates that proficiency levels have a significant association with all the strategies used by the students. Thus, the findings indicate that determination, memory, and metacognitive strategies work positively when there is a change in the proficiency level among the students, whereas social and cognitive strategies work negatively when there is a change in the proficiency level among the students.

Table 16. Impact of Proficiency Level on all Strategies

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	1.551	.783		1.981	.042
	Determination Strategy	.540	.239	.493	2.259	.023
	Social Strategy	-.405	.188	-.351	-2.154	.037
	Memory Strategies	.495	.211	.387	2.346	.030
	Cognitive Strategy	-.342	.206	-.275	-1.663	.098
	Metacognitive Strategies	.142	.059	.071	2.407	.029

a. Dependent Variable: Proficiency Level

Hence, the hypothesis that vocabulary learning strategies can vary based on learners' L1, gender, academic major, and proficiency level is accepted.

5. DISCUSSION

The findings indicate that undergraduate students at Karabuk University used a medium range of strategies. The findings are consistent with (Okyar, 2021; Rabadi, 2016; Behbahani, 2016; Al-Khasawneh, 2013; Hamzah, Kafipour, & Abdullah, 2009), in which the frequency of vocabulary learning strategies used was at a medium level. The findings of the determination strategies show that "Flash Cards" is the only strategy used at a low level. This result is consistent with a study by (Okyar, 2021; Al-Khasawneh, 2013), in which "Flash Cards" was the only strategy used at a low level. In contrast, all other determination strategies are used at a medium frequency because their percentage usage is not less than 50 percent or more than 70 percent.

The outcomes of the social strategies reveal that "Ask classmates for meaning" is the only strategy used at a high level. This finding is consistent with the findings of previous research (Yang, 2010; Vrettou, 2011; Al-Khasawneh, 2013), which showed that EFL learners indicated a high use of social strategies. In addition, the findings show that "The teacher checks students' flash cards or word lists for accuracy" is the only strategy used at a low level. In contrast, all other social strategies were used at a medium frequency because the percentage usage of the strategies was between 50 percent and 70 percent. These results are in concord with the findings of previous studies (Lee and 203 Oxford, 2003; Chen, 1998; Wharton, 2000; Wang, 2004; Yang, 2010; Vrettou, 2011) which revealed that EFL learners reported high use of social strategies.

The outcomes of the memory strategies indicate that "Study the word with a pictorial representation of its meaning" and "Associate the word with its coordinates" strategies are used at a high level. The findings coincide with a study by Mirioglu (2020), in which "Study the word with a pictorial representation of its meaning" and "Associate the word with its coordinates" strategies are used at a high level. The results also show that "Use scales for gradable adjectives", "Peg method", and "Group words within a storyline" are the strategies used at the low level. These findings are in line with previous studies conducted (Baharudin, 2019; Wang, 2018; Al-Khasawneh, 2013), in which "Use scales for gradable adjectives", "Peg method", and "Group words within a storyline" are the strategies used at the low level. In contrast, all other memory strategies are used at a medium frequency because their percentage usage is not less than 50 percent nor more than 70 percent.

The outcomes of the cognitive strategies reveal that "Verbal repetition" and "Keep a vocabulary notebook" are used at a high level. The findings coincide with several studies (Shamsan, Ali & Hezam, 2021; Okyar, 2021; Mirioglu, 2020), in which "Verbal repetition" and "Keep a vocabulary notebook" were identified as the most used strategies. The evidence for verbal repetition supports Nation (2001), who indicated that to gain proficiency in lexical items, they should be learned sufficiently. In addition, the results show that "Put English labels on physical objects" is the only strategy used at the low level. In contrast, all other cognitive strategies are used at a medium frequency because their percentage usage is between 50 percent and 70 percent.

The findings of the metacognitive strategies show that "Use spaced words practiced" is the only strategy used at the low level. Such findings coincide with other studies (Mirioglu, 2020; Aparı, 2016; Al-Khasawneh, 2013), in which "Use spaced words practiced" is the only strategy used at the low level. In contrast, all other metacognitive strategies are used at a medium frequency because their percentage usage is not less than 50 percent nor more than 70 percent. The moderate use of metacognitive strategies could be attributed to the fact that most respondents do not know how to employ metacognitive strategies efficiently in vocabulary learning (Leilei, 2016).

The findings indicate that male undergraduate students use VLSs at a higher percentage than their female counterparts. Hence, the hypothesis that female students use more strategies than their male counterparts is rejected. This result coincides with other studies (Baharudin, 2019; Chen, 2019; Zarei, 2013; & Ok, 2003), which also revealed that male students are more likely to use language learning strategies more than female students. The results also indicate that the students used all five categories of learning strategies, such as determination, social, cognitive, metacognitive, and memory strategies. These outcomes are in line with a study by Ansari, Vahdany, and Sabouri (2016), who also revealed that all the learning strategies are used by undergraduate students to learn the language.

6. CONCLUSIONS

This study aimed to examine the vocabulary learning strategies used by EFL undergraduate students at Karabuk University using a quantitative approach. The findings indicate that undergraduate students at Karabuk University used a medium range of strategies. Moreover, the results revealed that male students are more prominent in using language learning strategies than female students. Finally, the results also showed that metacognitive strategies have a positive linkage with the student's cognitive, social, determination, and memory strategies. The findings of this study will reflect on the teaching and learning processes in which instructors can employ the best VLSs to assist learners in learning vocabulary, and learners could become familiar with the strategies that suit them best. The study will also help by providing students with strategies that they could employ in vocabulary learning, which in turn will simplify the difficulties that students encounter in learning languages. Besides, teachers can use the outcomes of the study to assist high-achieving learners and motivate low-achieving learners.

The current research will provide learners with the appropriate strategies to assist them to learn vocabulary and enhance their academic outcomes. The results will serve English instructors, policymakers, Karabuk University, and academic institutions in developing courses and apps for vocabulary learning strategies that will help EFL learners achieve better learning achievements. It will throw more light on other academics and researchers interested in conducting more studies in the relevant discipline. The outcomes might be used as a reference by other researchers in conducting similar research but from other viewpoints. This study will give greater insights to language teachers and curriculum designers and developers related to the overall patterns of vocabulary learning strategies of foreign and Turkish EFL learners at the university level.

However, this quantitative study was limited to the context of Karabük University, and only 3 departments were included in the sample of the study. Hence, the obtained results cannot be generalized to other departments or other universities in Turkey. Therefore, similar studies need to be carried out within the context of other Turkish universities and institutes to be able to compare their findings with those of the present research. In addition, a need arises for more comprehensive research with a wide range of variables affecting the use of VLSs such as motivation, beliefs, cultural background, and learning styles.

About the Author

Khalefa Kheder PhD(c), Karabuk University, Türkiye and a lecturer at Idlib University, Syria.

ResearchGate https://www.researchgate.net/profile/Khalefa-Kheder.

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