THE EFFECT OF DIFFERENT TYPES OF MARGINAL GLOSSING ON EFL LEARNERS' VOCABULARY LEARNING

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İNGİLİZCE ÖĞRENCİLERİNİN KELİME ÖĞRENİMİ ÜZERİNE FARKLI MARJİNAL GLOSS TÜRLERİNİN ETKİSİ

(The Effect of Different Types of Marginal Glossing on EFL Learners' Vocabulary Learning)

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Mahdieh KARIMVAND tarafından hazırlanan "İngilizce Öğrencilerinin Kelime Öğrenimi Üzerine Farklı Marjinal Gloss Türlerinin Etkisi" başlıklı çalışması 10.02.2022 tarihinde yapılan tez savunma sınavı sonucunda başarılı bulunarak jürimiz tarafından Yabancı Diller Eğitimi Ana Bilim Dalı, İngiliz Dili Eğitimi Bilim Dalında doktora tezi olarak kabul edilmiştir.

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ÖZ

DOKTORA TEZİ

İNGİLİZCE ÖĞRENCİLERİNİN KELİME ÖĞRENİMİ ÜZERİNE FARKLI MARJİNAL GLOSS TÜRLERİNİN ETKİSİ

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Amaç: Araştırmacılar ve eğitimciler yabancı dilde metin okumayı kolaylaştıran teknikleri incelemek üzere ilgi gösterdiler. Son zamanlarda ikinci veya yabancı dil edinimi araştırması alanında inceleme altına alınan tekniklerden biri de imge (gloss)'dir. Bu araştırma, ana dilinde metinsel imge, yabanci dilde metinsel imge, ve görsel imgenin ingilizce öğrencilerinin kelime öğrenimi üzerindeki etkisini incelemek amacıyla yapılmıştır.

Yöntem: Araştırmanın denekleri 120 öğrencidir. Önce öğrencilerden ön test alınarak bu testten alınan puana göre öğrenciler çalışmaya seçilmiştir. Seçim yöntemi, %25'ten az doğru yanıtlayan katılımcıların seçilmesi şeklindeydi. Seçilen 80 katılımcı rastgele 20'şer kişilik 4 gruba bölündüler. İlk olarak, genel bir İngilizce testi deneklerin homojenliğini belirleyerek öğrenciler beceri düzeylerine göre gruplandırılmış ve rastgele deney ve kontrol gruplarına ayrılmıştır. Öğrencilere daha sonra ana dil, hedef dil, resimli olarak ve görsel imge olmayan bir anlama metni sunulmuştur. Veriler, çoktan seçmeli ve verimli hatırlatma teknikleri ile kelime öğrenme ve akılda tutma testleri yoluyla toplanmıştır. Gerekli veriler toplandıktan sonra, grubların performansları arasında anlamlı farklılıklar olup olmadığını belirlemek için One-way ANOVA, SPSS bilgisayar programı, ve Post-hoc karşılaştırması çalıştırılmıştır.

Bulgular: Sonuçlar, deney gruplarının kontrol grubuna göre kelime öğrenme ve kalıcılık testlerinde önemli ölçüde daha iyi performans gösterdiğini tesbitetmektedir. Tüm imge türleri, EFL öğrencilerinde değişen derecelerde kendini göstermiştir. Ek olarak, ana dilinde (L1) görsel imgeye sahip öğrenciler, belirgin şekilde daha iyi kelime öğrenme sonuçlarına sahipti. Bu çalışma, farklı görsel imge türlerinin öğrencilerin kelime öğrenmesini ve akılda tutmasını kolaylaştırdığı sonucuna varmıştır.

Sonuç: Bu araştırma sonuçlarında da görüldüğü gibi görsel imge, öğrencilerde kısa süreli kelime öğrenmede oldukça etkilidir, bu nedenle okullarda, yabancı dil özel kurumlarda ve hatta üniversitelerde kelime öğrenme tekniklerinden biri olarak kullanılmalıdır.

Anahtar kelimeler: İmge, Ana Dilinde İmge, Yabanci Dilde İmge, Metinsel İmge, Görsel İmge, Marjinal İmge, Kelime Hatırlama, Okuduğunu Anlama.

ABSTRACT

DOCTORAL DISSERTATION (PhD.)

THE EFFECT OF DIFFERENT TYPES OF MARGINAL GLOSSING ON EFL LEARNERS' VOCABULARY LEARNING

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Purpose: Educators and researchers have shown great interest in exploring techniques that facilitate foreign language reading. One of these technique, which has recently been examined in the field of foreign or second language acquisition research, is glossing. The aim of this study is to investigate the effect of first language gloss (L1), second language gloss (L2), and pictorial gloss on EFL learners' vocabulary learning.

Method: The subjects of the study were 120 students. At first, pretest was taken from students and based on the score of this test, students were selected for the study. The selection method was such that the participants who gave less than 25% correct answers were selected. The selected 80 participants were divided randomly into 4 groups of 20. The participants were grouped due to the level of proficiency and were divided randomly into control group, experimental groups, and reading with or without glosses. At first, the homogeneity of the subjects was determined by an English test. Then a passage was given to the participants as the reading comprehension text in four different glossing modes (L1, L2, Pictorial, and no gloss). Data were collected through Multiple-Choice (MC), Productive Recall (PR) vocabulary learning, and retention tests. One-way ANOVA, SPSS software, and Post-hoc comparison were used to determine the difference in performance of different gloss groups.

Findings: The results of the study show that the experimental groups performed significantly better in vocabulary learning and retention tests than the control group. All gloss types were manifest in EFL students at varying degrees. In addition, participants with mother tongue (L1) gloss had better vocabulary learning outcomes. The outcomes of this study also revealed that the role of glossing in short term retention was much greater than long term retention.

Conclusion: As it was seen in the results of this research, glossing is very effective in short term vocabulary learning in students, so it should be used in schools, institutions and even universities as one of the vocabulary learning techniques.

Keywords: Gloss, L1 gloss, L2 gloss, Textual gloss, Pictorial gloss, Marginal Gloss, Word retention/Recollection, Reading Comprehension.

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ABBREVIATIONS

DELMC	: Delayed Multiple Choice
DELPR	: Delayed Productive Recall
EFL	: English as a Foreign Language
ESL	: English as a Second Language
IMMC	: Immediate Multiple-Choice
IMPR	: Immediate Productive Recall
L1	: First Language
L2	: Second Language
MC	: Multiple Choice
MG	: Multiple Gloss
PR	: Productive Recall
SG	: Single Gloss
SLA	: Second Language Acquisition

CHAPTER ONE

Introduction

Overview

This chapter describes the essence of the study by providing some background information about the key ideas including vocabulary learning, various types of marginal gloss, and a summary of related studies. Then, the researcher discusses the purpose of the study, the research questions, and the research hypothesis. This chapter also provides a theoretical background and continues with the importance and assumptions of the study. The chapter will be concluded with definitions of the words to clarify common terms in the research and a summary of the structural domain of the research.

Research Background

Vocabulary learning is an important part of the process of teaching and learning a foreign or second language. According to Alqahtani (2015) vocabulary has a very important role in learning a foreign language, communicating, and improving reading comprehension. Thus it has a special place among the other components in reading.

Vocabulary is the key factor for understanding. It is recognized as a central factor in both native and non-native (EFL/ESL) language learning processes. If unknown words are not familiar to readers, they ignore them and fail to notice their meanings. As a result of this ignorance, the content of the text may not provide enough information to the readers to understand the meaning, and then comprehension may not be possible. Vocabulary is central to language and language learners, therefore, it has bothered almost all language learners to deal with it during the reading comprehension process (Hulstijn, 1992; Peters & Webb, 2018). Vocabulary knowledge is one of the important factors which influence L2 reading comprehension. Without this knowledge, no meaning may be conveyed either in oral or in written form. Previous studies have shown that lack of vocabulary knowledge and word meaning is the main obstacle for second language learners to overcome (Eshghavi, 2020; Nation, 2013; Ramezanali, 2017; Webb & Nation, 2017).

Alqahtani (2015) represented that in reading the text, students face limitations, one of which is the limitation of vocabulary. In EFL (English as a Foreign Language) domain, written

text is the main source of vocabulary learning and development. Therefore, it can be said that the great amount of unknown vocabulary is the main cause of students' frustration in the process of reading. Therefore, Alqahtani aimed to provide practical advice to English as a Foreign Language teachers on the use of visual glosses in reading text to help students get familiar with the vocabularies used in the reading passage, which ultimately improves the comprehension of students.

Since vocabulary plays an important role in learning a foreign language, language learners should use appropriate strategies for vocabulary learning. When learners encounter reading, they cannot read and understand the text properly if they do not have sufficient vocabulary knowledge. If there are too many new words in the text, students will be discouraged from reading the text (Ramezanali, 2017). Besides, language learners are faced with trying to recall, unsuccessfully, a word that has been in their vocabulary for a long time, and a word they have recently used, but they cannot use it at the appropriate time. Therefore, to meet these challenges, learners must face the target language words in different fields via various teaching vocabulary techniques. (Ramezanali, 2017). Nagy (2005) believed that vocabulary learning strategies can help learners to learn unfamiliar words, remember them for a long time, and use suitable words correctly in communicative texts.

Nation (2013) maintained that if the amount of unfamiliar words in a text increases, the comprehension of the text will decrease (Nation, 2013). The correlation between reading comprehension and word knowledge in the literature shows that if students do not develop their vocabulary enough, it will have a negative effect on reading comprehension (Choi, 2016). Some of the reading texts have strange words, and learners have difficulty comprehending the text. To solve such a problem of comprehension, the glossing technique is used to create understanding opportunities (Webb & Nation, 2017).

Most of the L2 learners' difficulties in reading comprehension arise from their lack of vocabulary knowledge. One method to decrease these difficulties is to help students to become independent learners in the vocabulary learning process. Some techniques for enhancing students' retention of new ideas and meanings have been tested via different efforts which include glossing, morphological and syntactic analysis (Ko, 2012).

The most fundamental factor of comprehension is the ability to deal with unknown words in a text. It may be stated that context provides cues to predict the meaning of unfamiliar words, but it is not enough to rely on context. There are some strategies (using a dictionary, glossing, and so forth) that can promote understanding unknown words during a reading

comprehension process. Glossing is regarded as one of the helpful and practical devices in enhancing reading comprehension. (Ramezanali, 2017).

Glossing is the process of simultaneous construction and finding meaning through interaction with the text. The success of this skill depends mainly on a good match of reader skills, the definition of the task, and the difficulty of the text. If you want to be a successful reader, you need to identify the individual words' orthographic, semantic, and phonological representations, and connect these representations to create an understanding of the basic meaning of the sentence. It can be said that mastering and acquiring this skill also require some complex strategies (Chen, 2016; Eshghavi, 2020; Ramezanali, 2017).

Glossing is a strategy through which a brief definition of an unknown word, either in the second language or in the first language, is provided to readers during the reading comprehension task. Researchers have proposed similar definitions of glossing (Ramezanali, 2017; Sato, 2016). As Nation (2013) stated, glossing is a short and synonymous definition, in the first language or second language that comes with the text. He believed that glossing is used to explain the right use of marginal notes or pictures to direct readers' attention to the text while they are reading. Glossing is the best form of text simplification since it helps the reader to comprehend words and phrases and, therefore, assists second language learners to understand reading materials. The most important reason to use glossing is to learn new vocabulary and help readers understand the text better (Alqahtani, 2015).

There are various types of glossing that are classified according to forms, situations, and languages. Categorization based on the form includes textual and pictorial glosses. The form-based classification includes text, image, and multimedia gloss. Besides, there are "multiple" versus "single" glosses, and "meaning inferred" versus "meaning given" ones. Position classification consists of pre-text, and post-text, marginal, and interlinear glosses. According to the language of glossing there are two common types of native language (L1) and foreign or second language (L2) glosses (Biria & Farvardin, 2012; Chen, 2016; Ko, 2017).

Researchers that study gloss want to know how types of gloss will facilitate foreign or second language learners' acquisition of new vocabulary (Akbulut, 2007; Babaie & Razmjoo, 2015). Although many studies have been done on the effect of gloss on word learning (Babaie & Razmjoo, 2015; Erçetin & Türk, 2014; Eshghavi, 2020; Ramezanali, 2017; Shams & Tabatabaei, 2011; Yun, 2011), most findings are controversial, and they are not comprehensive in showing which gloss type is more effective in learning new words and increasing the ability of long term word recall and retention. Findings of Mohsen and Balakumar (2011) showed positive effectiveness for two modalities of video and text gloss in simplification of word

learning and retention in comparison to the only textual definition because of some factors such as proficiency level, students' linguistic and cultural background, target language differences, and word difficulty level.

Cheng and Good (2009) mentioned the following advantages of using glosses:

- First, glossing provides readers with the more accurate meaning of new words preventing them from incorrectly guessing their meaning
- Second, it allows texts that are not adapted and simplified to be used.
- Third, the glossing technique provides a meaning close to the target word, thereby it minimizes reading interruptions.
- Fourth, glosses can help students to be less dependent on their teachers, and allow for greater autonomy
- Fifth, it draws the reader's attention toward unfamiliar words and encourages incidental vocabulary learning. (Cheng & Good, 2009, pp. 18-20).

Some scholars studied various types of gloss and their combinations of texts, audios, audio and videos, and pictures (Al-Ghafli, 2011; Aust & Salem, 2007; Erçetin & Sakar, 2005; Salem, 2006; Shams & Tabatabaei, 2011; Tseng & Lin, 2012; Wang, 2016; Yanguas, 2009). For the researchers that used pictures as a gloss type, findings indicate no meaningful difference in vocabulary learning (Wang, 2016). Therefore, further studies are required to analyze the impact of textual and pictorial gloss on second language vocabulary learning.

Similarly, according to Ramezanali (2017), different modes of presentation, video gloss, pictorial gloss, and textual gloss had the same impact on the learners' vocabulary learning. She believed that only defining a word via text had more impact on learners' vocabulary learning. Similarly, Warren et al., (2017) indicated that when comparing two kinds of pictorial and textual gloss, the pictorial gloss did not help learners to learn and recall new vocabularies.

Statement of the Problem

Researchers in the field of gloss want to know how different modes of gloss facilitate EFL learners' word learning (Salem, 2006). However, many studies have been done on the effect of gloss on EFL Learners' new word learning (Erçetin & Türk, 2014; Eshghavi, 2020; Ramezanali, 2017; Shams & Tabatabaei, 2011; Yanguas, 2009; Yoshii, 2014; Yun, 2011), and word retention (Aust & Salem, 2007; Ramezanali & Faez, 2019; Salem, 2006). The findings

provide a controversial and inconclusive document as to what gloss type is more appropriate in new word learning and retention in the long term and short term.

Considering studies on the domain of glossing, very little is known about the glossing effect in the first language (L1), second language (L2) texts, and pictures on vocabulary learning. Therefore, there is a need for further studies on glossing, including L1 gloss text, L2 gloss text, and pictures on second language learning. Therefore, more research is needed to determine which type of gloss helps foreign language or second language learners in improving EFL learners' new word learning and enhancing long term and short term word retention.

Purpose of the Study

A review of the studies on glossing shows that only a few studies are concerned with the effect of gloss strategies in the second language (L2), first language (L1) texts, and pictures on vocabulary learning. Further studies are needed on the area of mixed glossing which considers the simultaneous presentation of L1 gloss, L2 gloss, and pictures on new word learning. Thus, further research is needed to determine what kind of gloss better helps foreign language or second language learners in improving new word learning and retention.

Mixed methods research design has been used in a few studies to investigate the effects of various gloss types on vocabulary learning. Some studies have used qualitative research for investigating the gloss types on vocabulary learning and reading comprehension. Other studies have used quantitative research to investigate the application of different types of gloss on vocabulary learning, fluency of reading, and vocabulary retention. Therefore, more studies, similar to this one, are needed on the role of different types of gloss including L1 gloss, L2 gloss, and pictorial gloss on vocabulary learning and word retention by mixed method research design.

This section contains rationales for choosing vocabulary learning through glossing as a research topic. Finding the most effective strategy that helps students memorize new vocabularies and improve comprehension and communication, as they learn English, is fundamental. So, in this study, the researcher selected word learning and retention as the focus of the study. The researcher found that unfamiliar words could be learned better and faster when the reader learned them with definitions or pictures. Therefore, finding beneficial gloss-based word learning techniques, which can help learners learn vocabularies and remember them for a long time, creates a unique study and may be added to the available literature in this field of study.

Research findings show that language learners benefit more from vocabulary gloss at the intermediate level because they have sufficient second language ability, and they know how to use glosses appropriately (Erçetin & Sakar, 2005; Ko, 2012; Ramezanali & Faez, 2019).

The level of proficiency is a determining factor in the effects of glossing. It can be said that gloss types have positive impacts on intermediate-level learners. Intermediate-level foreign language (FL) learners were selected for the research.

Research Questions

Research questions related to the usefulness and function of glossing are the foundation of the research questions in the present study. Three gloss conditions, L1 textual, L2 textual, and pictorial gloss were compared and examined in terms of effectiveness on the reading comprehension of participants. As a result, four research questions have been searched in the study:

1. Will language learners who use gloss generally perform better than learners without gloss?
2. Will language learners who use L1 gloss perform better than learners who use L2 gloss?
3. Will language learners who use picture gloss perform better than learners who use textual gloss?
4. What are language learners' perceptions and attitudes towards learning through gloss modes? What kind of gloss types do they prefer?

Research Hypothesis

The four research hypotheses are consistent with the research questions that were formulated as follows:

1. Language learners using glossing will do the test better than learners who use no gloss.
2. Language learners using L1 gloss will do the test better than learners who use L2 gloss.
3. Language learners utilizing pictorial glosses will do the test better than learners using textual glosses.
4. Students using glossing will find it very helpful; and they will like different types of gloss.

Significance of the Study

The findings of the research are expected to reveal how glossing types affect vocabulary learning in second language learning situations. The study might provide new insight into using glosses, among other strategies that have not received the scholar attention they deserve.

The main goal of the research is to provide more vision about the effect of first language and second language gloss on new word learning and retention of words. This study is intended to help language teachers as well as language learners to promote the vocabulary learning process. It can help students to deal more easily with reading skills and vocabulary learning. It can also be helpful for language teachers in the way that they can use this method in teaching reading skills and new lexical items. Hence, using glosses in this research is significant in such a way that it helps teachers to encourage language learners to read more materials, recall more ideas, and learn more new vocabulary.

The findings of this study are expected to reveal that gloss can help language learners to discover which language techniques can help them to understand texts more efficiently, learn new words through reading texts, develop other reading techniques, and raise their retention potentialities in vocabulary areas. Furthermore, it appears that learning vocabulary from reading can promote learners' autonomy and help them to read and learn new words at their own pace. This study may give an insight into the appropriate reading methods and strategies according to the corresponding language proficiency of language learners. EFL teachers, textbook writers, and EFL students can receive some insight from the findings of the current research.

Key Terminologies

This part of the dissertation is dedicated to the key terminologies that are addressed throughout the current study. We will attempt to clarify the ambiguous terms that are extensively and variously referred to in the literature and elucidate the theoretical coinages to streamline the uptake of the current dissertation.

To inaugurate with the term 'gloss' in the title of the dissertation, a "gloss" is a brief notation, an explanatory comment, or a picture that is added to a text to clarify its meaning to the reader. Glosses can be situated in different places such as in the margin of the page, at the bottom of the page, or in the appendix of the text. Gloss is referred to the explanation of vocabularies that are shown on the reading passages' margins and aids language learners understand the meanings of the vocabularies. It has three types: L1 textual, L2 textual, and pictorial.

Another word is Textual Gloss, which refers to a synonym, a definition, or an explanation that is provided for an unfamiliar word within the text. Textual gloss can be either in the reader's mother tongue or in the target language.

First language gloss (L1 gloss) **–** This kind of gloss refers to an explanatory comment in readers' first language.

Second language gloss (L2 gloss) **–**This kind of gloss refers to an explanatory comment in readers' target language.

Pictorial gloss – This refers to any kind of picture, line drawing, map, and graph added to a text.

Target glossed words – Every new word that is used as glossing during the reading process is referred to as target glossed word. Researchers test target glossed vocabulary after giving instruction and after two weeks to assess the gained vocabulary knowledge.

Textual gloss – A textual gloss may be defined as a short notation which is usually written on the margine or even between lines of a text and includes the meaning of word within that text. This narration can be in the target language or in the mother tongue of the reader.

Marginal gloss – When a gloss (textual-pictorial) is placed in the margin of the page rather than at its bottom or in the appendix, it is referred to as a marginal gloss.

Reading comprehension – Reading comprehension is the ability to understand a text completely, to find out the meaning of the whole text, and to accompany what the reader already knows.

Word retention/Recollection **–** Retention or recollection of a new word is explained as the ability to give the vocabulary meaning after a given period of time. Short term retention and long term retention are two types of word retention.

Overview of the Dissertation

There are six chapters in the present dissertation. The first chapter is the Introduction, which highlights the problem statement. It shows the study background, the study logic to justify the need to address this action research, in addition to the purpose of the study and related research questions that guided the entire study. This chapter concludes with the limitations of the study, the definition of terms, and the outline of the dissertation. Furthermore, the importance of the study will be stated to emphasize the significance of the study in practice and research. The second chapter is the Literature Review. This chapter presents the review of the

literature related to the theoretical positions of the study, which focuses on Glossing and different types of glossing effects on vocabulary learning. The principles of glossing are described and are followed in the relevant literature in glossing settings. In the context of this research, the challenges and benefits of using the glossing technique in learners' reading courses in ESL/EFL settings are discussed based on previous research that has been investigated in this field. The third chapter is Methodology. It details and elaborates on the research design, data collection tools, participants, the procedure of data collection, and data analysis. The fourth chapter is Results. It presents the findings obtained through analysis. In this chapter of the research, the data collected during and after the application of different types of marginal gloss, are interpreted concerning the research questions of the study, and they are examined by referring to the related literature. In this chapter, the data collected during the research are explained to give a clear realization of what can be added or removed from English curriculum contents. These data are discussed by referring to participants' feedback and evaluation during and after the course and by discussing related research in this field. Finally, conclusions are drawn based on the evaluation performed by the participants and the suggestions of experimental research. The fifth chapter is Discussion. In this chapter, the findings are discussed depending on the related literature. The sixth chapter is the Conclusion. It mentions the main findings of the study and expresses the implications, limitations, and strengths of the study. Then it gives some suggestions for further research.

Conclusion

In this chapter of the research, the importance of the study and implementation of subsequent conceptual terms were introduced. Then, the problem statement, the scope and purpose of this study, and the reasons were discussed. After that, the research questions and research hypotheses were presented. After presenting the definitions of the words, this chapter ended by providing a summary of the first part of the dissertation.

CHAPTER TWO

Literature Review

Overview

The present study was aimed at assessing the effect of marginal gloss on language learners' vocabulary learning. Numerous reports exist indicating that using marginal glosses in language teaching, and vocabulary learning leads to a meaningful connection between words and pictures and thus maximizes language learning (Mayer, 2014).

This chapter consists of 10 sections. The first and second sections are devoted to the importance of vocabulary in language learning and word retention. Sections three and four deal with the dual coding theory and idea recall. Reading comprehension and vocabulary knowledge are discussed in the fifth section. Sections six, seven, eight, and nine discuss the concept of glossing and its functions. The last section is devoted to empirical studies conducted in this area of research.

Importance of Words in Language Learning

Knowledge of words is regarded as the main factor to master another language (Schmitt, 2010). When foreign or second language (FL/L2) learners learn a new language, they need to reach a certain vocabulary knowledge to develop language proficiency (Lomicka, 1998). L2 learners need to learn language skills including reading, speaking, listening, and writing. Therefore, these skills require vocabulary knowledge, and language skills are affected by students' nonexistence of vocabulary (Zhang & Li, 2011). In a study, Wesche and Paribakht (1999) noted that learning vocabulary is a reversible process combining different types of knowledge with acquiring various abilities to use this knowledge in communication. Similarly, according to Nation (2013), by knowledge of vocabulary, it is possible to use language for increasing word knowledge, which increases the knowledge of vocabulary and using language. Besides, to know a word, it is required to identify and use the word appropriately. Nation (2013) denoted vocabulary knowledge as the capability of recognizing the written and spoken forms of a word and its meaning (p. 47).

Vocabulary learning not only positively affects language proficiency, but also is considered as one of the sub-objectives of a goal range in the language class (Nation, 2013, P. 47). Other objectives are to learn the pronunciation of words, the rules of discourse, the grammatical constructions of a language, and the target language culture (Nation, 2013).

Second language learners should comprehend numerous vocabularies to understand another language (Schmitt, 2010). Nevertheless, working on the useful words required for knowing and using English is a way to adjust the vocabulary learning objectives for FL/L2 learners (Schmitt, 2010). On the other hand, Schmitt (2010) believed that word coverage is the lexical items percentage in spoken or written discourses that a learner should know. From Schmitt's point of view, a significant understanding of oral communication can occur with a coverage rate of 90% and less than 95%. To endorse vocabulary learning, there are other vocabulary learning methods including learners' engagements with words, intentional/explicit vocabulary learning activities, and time spent on learning a lexical item (Schmitt, 2010). To reach the form-meaning link, one can pass the explicit/ intentional language learning (Schmitt, 2010). This is the subject of discussion for the next section.

Explicit or Intentional Vocabulary Learning

Explicit or intentional vocabulary learning is a method to new word learning and instruction (Akbulut, 2007; González-Fernández & Schmitt, 2019; Schmitt, 2010) in which the vocabulary of the target language is learned while concentrating on meaning and form using antonyms, synonyms, word substitution, scrambled words, crossword puzzles, and multiple-choice items (Akbulut, 2007). According to Schmitt (2010), learning intentional/explicit vocabulary always results in faster and greater achievements, more likely to maintain and achieve mastery at productive levels. In intentional or explicit vocabulary training, first, the new words are identified that are essential for the learners and then provided to the learners for the first time. In incidental or implicit new word learning, it is concentrated on the learning activity rather than learning words (Akbulut, 2007). However, the focus is on the comprehension exchanging the oral or written message (Coady & Huckin, 1999). In other words, L2 learners need incidental vocabulary learning to acquire unknown target words, because of engagement in other learning activities like reading for gaining information, for pleasure, or for using language (Choi, 2016). Moreover, the learners' attention is focused on conveying the message, not the linguistic structure (Wesche & Paribakht, 1999) while vocabulary learning intentionaly or explicitly is indorsed when the learners are informed previously of a retention test followed by a reading task aimed to obtain form and meaning of a word (Coady & Huckin, 1999). The new deliberate or explicit word learning and incidental acquisition of words can each result in word knowledge mastery (Nation, 2013). However, studies indicated that intentional learning outcomes in further new word learning and operative means of incrementing word size rather than incidental learnings (Nation, 2013). Schmitt (2010) indicated that mere explicit or deliberate learning may hardly present the understanding

of collocation, grammar, associations, constraints, and reference on using, which be learned through meeting items in context (p. 42). Consequently, through incidental/implicit vocabulary learning, the learners could learn contextual characteristics of vocabulary knowledge like collocations (Nation, 2013).

Generally, vocabulary learning leads to the development of approaches and techniques assisting learners in gaining numerous words and helping them to recollect the words. The current study aimed to evaluate the efficiency of one of the new word learning approaches, known as glossing, to increase new word learning of L2 learners. Here, intentional or explicit vocabulary learning was highlighted as an extensive vocabulary learning method for consolidating form-meaning association and helping second language learners to use and remember the unfamiliar words over a course.

Memory Retention and Vocabulary Learning

Memory is defined by Merriam-Webster as the power of recalling what was formerly experienced or learned. Nevertheless, Preston (2007) indicated that memory is the ability of brain or mental capacity to recover, retrieve, and remember former events, facts, and impressions. Moreover, they introduced three main phases in the retrieval of memory and formation processing including first, registration or encryption, which requires receiving, combining, and processing the received information. Second, data storage, involving the creation of a permanent record of encrypted information, and third, retrieval including preserving the information stored against certain cues for use in an activity or process (Preston, 2007). Various memory types and the relation between memory retention and vocabulary learning are discussed in the next section.

Memory Types

Zhang (2004) represented three kinds of memory based on time: long term memory, sensory memory, and short term memory. The shortest memory is sensory memory lasting for a few seconds (Zhang, 2004). Nevertheless, the memory is termed short term memory if information lasts within few seconds to few minutes (Zhang, 2004). Short term memory was denoted by Preston (2007) as an active, primary, and working memory. Information that is already being processed is preserved by short term memory including a first revealed novel word. According to Zhang (2004), although short term memory is fast, it includes a restricted capacity to preserve data in an available and active state for a short time. Nevertheless, long term memory is lasting from one hour to a lifespan.

Erçetin and Varol (2016) presented that long term memory possesses an unlimited capacity for storage and can preserve an indefinite quantity of data given that some alterations occur in the long term memory. A change in the long term memory of a learner cause learning any material like vocabulary. Consequently, proper changes to long memory need to be the main objective of instruction in vocabulary learning settings; nevertheless, long memory processing is fairly slow.

Vocabularies and Retention

There is a close association between memory and the capability of retaining and recalling information. According to Mayer (2014), the data kept in the sensory memory is transported from the short memory to the long memory by sufficient attention, the repeated data, and enough time through an integrated process. Moreover, connecting novel information with old ones means creating a link between them to store the new information in memory (Ellis, 1997). Learning a new word is creating an association between meaning and form. Such an association may appear as the form of the first language equivalents; second language (L2) in-text definitions or synonyms, as well as visual images such as dynamic videos/animations or static pictures, sounds, emotion and feelings, a certain context or situation, or an integration of these (Chen, 2016; Ko, 2012; Namaziandost, et al., 2020; Plass & Chun, 1996; Xu, 2010; Yoshii, 2014).

Therefore, in order to accurately transmit the data from working memory to long term memory, the language learners should act on data rather than meaningfully interact with the information (Schmitt, 2010). Moreover, language learners should search for differences and relationships between the data and other information existing already in long memory and connect them (Mayer, 2014). A way to transmit novel vocabularies from the short memory to the long memory is to make connections by finding certain elements in the mental vocabulary and attaching a new vocabulary to those elements (Schmitt, 2010).

Learning Strategies in Vocabulary Retention

Vocabulary learning was stated by Laufer and Rozovski-Roitblat (2015) as the heart of any language use and learning; therefore, it deserves complete research. Furthermore, retaining numerous vocabularies in memory is a difficult task for language learners. However, no clear comprehension has been performed on the best effects of vocabulary learning approaches helping language learners to learn and remember new words. The possible reason is that vocabulary learning has multifaceted and complex approaches affected by various factors (Eshghavi, 2020; Gu, 2003). These factors are (a) differences of language learners like beliefs,

motivation, and attitudes; (b) language learning experiences of the learners including gender, course type, and a field of study; and (c) learning outcomes of learners such as vocabulary knowledge, language achievement, and proficiency (Boonkongsaen, 2012). Thus, it is not amazing that language learners and teachers are still not certain about the best probable methods to trace new word learning policies in language classes (Schmitt, 2010). Furthermore, it is a challenging task to recollect numerous new words in memory for language learners.

Language learning strategies were defined by Oxford (1990) as the steps taken by students to strengthen their learning. Furthermore, whatever language learners use to make learning easier, more enjoyable, and faster is considered a language learning approach (Oxford, 1990). A subset of language learning strategies is vocabulary learning policy as a learning method facilitating vocabulary learning, leading language learners to become responsible for their learning, helping them being active contributors in the process of learning (Nemati, 2013). Moreover, it directs learners both to discover the meaning of a word and consolidates it (Celce-Murcia, 2001). Vocabulary Learning Strategies are considerably strained by some investigators and their effectiveness is examined extensively (González-Fernández & Schmitt, 2019; Ramezanali, 2017; Rott, 2007; Williams et al., 2002). Concerning vocabulary instruction, studies indicated that the people using different vocabulary learning approaches could act well in learning words and possess retention of longer words in comparison to those only memorizing the words. (Gu, 2003; Ramezanali, 2017).

Considering the significant role of new word learning in language learning, in written and oral language understanding, it is important to determine vocabulary learning which is aimed to contribute to language learners in both remembering and using words in various language contexts. Researchers and language learners should establish language learning approaches to help the learners to know the words and apply them in the correct situations. Language learners might utilize various tasks for vocabulary learning to determine how well a new word is learned to a large extent (Gu, 2003). Such tasks are guessing the meaning of a word and using existing clues, viz. extensive reading, and meaning inferences, looking up words in a dictionary, taking notes in the margins of the pages, between separate vocabulary notebooks or between the lines, repeating the vocabularies many times, and utilizing the vocabularies in communicative glossing and occasions actively (Schmitt, 2010).

Knowledge of vocabulary is considered as one of the main necessary factors to master another language. When learning a new language, EFL learners need to obtain a definite vocabulary threshold for developing linguistic capabilities for using the language (Schmitt, 2010). The learners also need to signify the four language skills (listening, speaking, writing,

and reading). Consequently, word knowledge is essential for such skills, and all four language skills are affected by the nonexistence of vocabulary knowledge (Zhang & Li, 2011). Wesche and Paribakht (1999) indicated that vocabulary acquisition is an increasing and recursive procedure involving the integration of different knowledge accompanied by gaining different ability levels to utilize the knowledge in communication.

Knowledge of a foreign language vocabulary is often important to many people around the world for academic and professional success, and personal development. By having good vocabulary knowledge, you can improve your reading comprehension. Reading comprehension is a process of recognition of all aspects of information, thought, and feeling which are desired to be conveyed by the writer through a text. According to Hong (2010), successful reading comprehension requires active participation by the reader. Despite this special need and importance of reading in a foreign language, most EFL teachers commonly declare that the students are not able to understand texts effectively in foreign language.

Researchers believe that linking L2 words to their L1 equivalents is important, especially at the first steps of the learning process when the first form-meaning connection has to be created (Ramezanali, 2017; Schmitt, 2010).

The present work concentrates on glossing as an instructional and practical tool of the memory-helping policy. Glossing is effective since it presents exact meanings for words probably not correctly guessed (Yanguas, 2009). It includes minimal interruption to reading in comparison to using dictionaries (Shiki, 2008), and attracts attention to words aiding the acquisition procedure (Schmitt, 2010; Yanguas, 2009). Therefore, more attention is required.

Many studies have examined the impacts of glosses on reading comprehension and new word learning. Those studies found one type superior to the other type (Alqahtani, 2015; Chen, 2016; Eshghavi, 2020; Miyasako, 2002; Ramezanali, 2017). In one study, Shiki (2008) made a comparison between two types of gloss, L2 gloss and L1 gloss, with 85 participants. Their first language was English, and their second language was Spanish. The students read a text in three different circumstances. The first group read the text with L1 gloss, the control group read the same text with no gloss, and the second group read it with L2 gloss. The target words were underlined, and the students took delayed and immediate posttests after reading the text. The findings revealed that gloss groups were better than the no gloss group. However, no considerable differences were found between L1 and L2 gloss groups. Chen (2016) investigated L1 and L2 gloss groups. In his study, there were 85 students with English as the second language. The students were classified into three groups of L1 gloss group, L2 gloss group, and no gloss group. A text with 20 boldfaced target words was given to the participants. The gloss

groups got higher scores than the no gloss group. No considerable difference was found between the L1 gloss group and the L2 gloss group.

Shiki (2008) examined the effectiveness of L2 glosses and L1 glosses on new word learning and word retention in a multimedia setting. The subjects were 70 EFL learners, which were divided into four groups of L2 gloss, L1 gloss, L2 with picture gloss, and L1 with picture gloss. They were requested to read a text with ten target vocabularies. Then, a vocabulary recognition posttest was provided for them immediately and two weeks later. It was found that L1 gloss significantly performed well on posttests compared to the L2 gloss group.

The Dual Coding Theory

The cognitive theory of DCT (dual coding theory) (Paivio, 1991) explains the dominant impacts of mental imagery on the memory and mind. Dual Coding Theory is oriented by the opinion that mental image formation helps within the learning course (Reed, 2010). This theory assumes the presence of two separate, rather interconnected coding systems storing and processing data in the memory: (1) a verbal system and (2) a nonverbal or visual system. The linguistic units (like text and sound) are stored in the verbal system in sequential units known as logogens. The visual units (like animations, pictures, and or videos) are processed by a non-verbal/visual system and kept in units known as images. Through referential connections, the two systems are connected.

The DCT mainly assumes processing verbal or visual and non-verbal modes by two various coding systems. Nevertheless, by interacting with these non-verbal and verbal or visual systems, the better recall is resultant by activation of both systems (Al-Seghayer, 2001; Paivio, 1991). Paivio (1991) indicated three various processing levels occurring between or within verbal and nonverbal/visual systems including referential, representational, and associating processes.

The representational process denotes activating the visual and verbal representation through a stimulus where the verbal representation is activated by the words, and visual representation is activated by the pictures. Referential processing represents activating either system by the other one, meaning the words are activated by the images or objects, and the words activate images or objects. Associative processing denotes activating further information in referential or representational systems. Here, the associating connections between sounds and words (linguistic units) are activated in the images and the verbal system in the visual system (Paivio, 1991).

Studies indicate that the words related to the images or actual objects are obtained more simply and retained more effectively compared to those provided alone (Paivio, 1991). Since the present study aimed to assess vocabulary learning of L2 learners based on long and short term word retention through exposure to various integrations of verbal representations (L1, L2) and visual displays (Pictorial glossing) in a learning setting based on multimedia, the double-coding theory presented a base and solid framework to develop the visual and verbal aids. Therefore, it was supposed that when the glossed words are associated with images or sounds by L2 learners in double modes at a time, the words would be learned better and retained easier compared to when they use only one mode (Paivio, 1991). Tseng and Lin (2012) indicated that using illustrations and pictures related to the unknown words is an effective instructional device greater than only words for tasks of memory. Moreover, it will assist second language learners to remember the vocabularies soon and maintain them for a longer period of time. The double relationship of visual and verbal modes or annotations is impressive as well since, if by losing a memory trace, the other is accessible and remains. Therefore, the dual coding theory is best used in second language learning settings where videos, audios, texts, and pictures are utilized. In other words, a language-learning environment considerably affecting vocabulary learning is made by exposing students to multiple modes of presentation like sound, printed text, pictures, animations, and video (Al-Seghayer, 2016).

Idea Recall

The capability to read the written language with good comprehension and at a reasonable rate is often all that is needed for learners of the EFL field. Despite this specific requirement for reading in English, it is the common experience of almost all language learners that they experience considerable difficulty in comprehending the English texts when they face them for the first time. Many researchers (Alqahtani, 2015; Davis, 1989; Ramezanali, 2017; Yanguas, 2009; Yoshii, 2014) noted the importance of text structure in affecting readers to remember the amount of information. Readers' comprehension of a text is affected by text organization. They believed that text structure helps the readers to differentiate between unimportant and important data as well as recalling.

For readers, understanding the organization of texts is very important. Al-Ghafli's investigations (2011) showed that the rhetorical patterns of the text affect reading comprehension and recall. The read-recall test is regarded as a reliable and valid instrument to measure readers' recall of the text. Mohsen and Balakumar (2011) pointed out that there are four different indicators of text recall:

- Idea units that correspond to propositions

- Main ideas that correspond to macro propositions
- Elaboration
- The coherence of recall is determined as the precision of the sequence of remade idea units or main ideas. (Mohsen & Balakumar, 2011, PP. 3-16).

Recall Protocol

Recall protocol is often utilized in second language reading research as a comprehension measure. It is believed that recall protocol requires readers to integrate the reading passage components. Besides, significant relation was found between written and oral recall tasks to reading proficiency (Lomicka, 1998). Lomicka (1998) reported that by recall protocol data are provided reflecting the reading information nature. Moreover, she claimed that the recall protocol is a valid measure to comprehend reading since it conforms to present theories driven by second language reading comprehension research.

In a free recall test, the comprehension of the participants of a reading text is measured through scoring their recall protocol. In this technique, the participants write their comprehension of the texts on a piece of paper right after reading. As Azari (2012) stated, the procedure of recall protocol is not hampered by possible inference from test items and is more likely to concentrate on the communication between reader and text. The recall protocol is scored based on the absence or presence of idea units presented in the scoring template. Azari (2012) defined an idea unit (also is referred to as linguistic units) as the smallest number of words essential to state an idea or thought. The type of recall writing which is employed in this study is free writing recall protocol which is a tool used by other more recent studies (Azari, 2012) regarding the impacts of types of glossing on reading comprehension of EFL students. Some studies done on the concept of recall are presented in the following section.

Recall

As it can be understood, the most prevalent methodology that most of the mentioned works enjoyed was to apply reading texts with gloss words inside to know which types of glossing are more helpful for the language learners. Because of its usefulness and practicality, this methodology is adopted for the present research. Yet, this methodology will be used with some changes according to the aims and scope of the present work. In the next chapter, the methodology employed for this study will be explained more precisely.

In this chapter some insights are presented about vocabulary knowledge, reading comprehension, and its relation with reading comprehension, language proficiency and its

impact on reading ability, definitions of glossing, and issues around this reading strategy. Also, several studies conducted in reading and glossing fields were mentioned.

Yoshii (2014) investigated the three gloss types which Kost et al. (1999) formerly assessed, however, the difference was using a computer for reading. The subjects were 151 students learning English as a second language. A text with 20-word glosses was read, among which 14 target words existed. The subjects were allocated to three groups based on three gloss types: (a) text with second language gloss; (b) picture and (c) text with second language and picture. They were requested to do the delayed and immediate tests after reading. The results indicated that picture and text glosses were superior to picture only and text-only glosses.

Plass and Chun (1996) and Yanguas (2009) discovered the impacts of glosses on reading comprehension and vocabulary learning in multimedia situations. The researchers utilized a within-subjects design. The students read the text with the same conditions on their computers. Some vocabularies were glossed with text, with pictures and text, and some with video clips and text. Then, they took a recall test and a vocabulary test. The outcomes indicated that combining picture and text glosses was more operative than only text or video clips and text glosses in recalling new vocabularies. Furthermore, reading comprehension was also facilitated by visual multimedia.

In Yanguas's study (2009), a computerized text was read by 94 participants in one of four types of gloss circumstances of pictorial, textual, no gloss (control), and textual + pictorial. Reading recognition, comprehension, and production measures were used in tests, however, the recognition tests were not used. Interaction effects existed between design and languages. The data analysis indicated that considerably more of the target words were considered and identified by all gloss groups in multimedia situations compared to the control group. No considerable difference was found among any of the groups in producing the target vocabulary items. All other groups in reading comprehension were outperformed by the combination gloss group. Glossing is a way for improving incidental vocabulary learning (Hong, 2010). Yanguas (2009) noted that glosses assist the subjects to match the common meanings of the sentences but he does not make any kind of lexical relationship probably signals deep processing of the word. Such a performance of the subjects in the gloss groups appeared to be enough to better perform than the control group in recognizing tests but not in the production experiments (Yanguas, 2009, p. 60).

Another study about multimedia glosses by Yoshii (2006) differed from previous research in two ways: 1) in this study, audio was used as the component of multimedia glosses; 2) both mother tongue and target language were utilized in text glosses. The participants were

82 high school students. Different types of gloss were assessed in the study including (1) text; (2) text with picture; and (3) text with sound and picture. The text is contained within both L2 (English explanations) and L1 (Chinese translations). The findings indicated that the most effective type among the three types of glossing was the combining picture and text.

Three questions were raised in Yoshii's (2006) study: 1) Are first language and second language glosses different in their efficiency on incidental word learning? 2) Is there any effect of interaction among the factors? 3) Are there any differences between no picture glosses (text-only) and picture glosses (text with picture) and their effectiveness on incidental word learning? The findings showed that no considerable differences were found between mother tongue and target language glosses in the recognition tests. The considerable difference was found between definition-supply tests and picture glosses and text-only tests for both the recognition and definition-supply tests.

In Yanguas's study (2009), a computerized text was read by 94 participants in one of four types of gloss circumstances of pictorial, textual, no gloss (control), and textual + pictorial. Reading recognition, comprehension, and production measures were used in tests, however, the recognition tests were not used. Interaction effects existed between design and languages. The data analysis indicated that considerably more of the target words were considered and identified by all gloss groups in multimedia situations compared to the control group. No considerable differences were observed between groups in producing the vocabulary items. All other groups in reading comprehension were outperformed by the combination gloss group. Glossing is a way for improving incidental vocabulary learning (Hong, 2010). Yanguas (2009) noted that glosses assist the subjects to match the common meanings of the sentences but he does not make any kind of lexical relationship probably signals deep processing of the word. Such a performance of the subjects in the gloss groups appeared to be enough to better perform than the control group in recognizing tests but not in the production experiments (Yanguas, 2009, p. 60).

Yoshii (2014) studied the efficiency of the first language (L1) and second language (L2) glosses on new vocabulary learning. He investigated whether using glosses with pictures or text plus pictures influences vocabulary learning. In this study, 195 college Japanese students learning English were classified into four groups of (a) only second language gloss; (b) only first language gloss; (c) first language text plus pictorial gloss; and (d) second language text plus pictorial gloss. A story with 390 words was read by the participants on the computer with fourteen highlighted glossed words. When clicking on a word by participants, gloss types were shown on the right side of the screen. Both the picture and the gloss appeared on the screen

with text-plus-picture glosses. Two posttests were received by participants one directly followed by reading and after two weeks. The test had two types of recognition definition-supply test. Based on the results, no considerable difference was found between first language and second language glosses at each test. A unique pattern of retention was found in the first language (L1) text group, which was able to sustain its scores. However, the declines in the scores were dominant in the other three groups.

Jacobs (1994) used a recall protocol and 85 participants were asked to (1) write whatever they remember in the L1, then read an L2 text, and (2) translate the expressions into English. It was indicated that no important difference exists among the three circumstances on vocabulary learning and reading comprehension. However, high-proficiency subjects with glosses recalled more of the text, and those with glosses acted well in the word translation tasks. It was also indicated that important differences appeared only in the immediate word tasks, and no differences were observed on the delayed word tasks. The research ascribed the slightly enhanced effect on the text recall to the higher language proficiency of the subjects, and presented two possible clarifications in line with this view. First, these subjects may take into account the assumption that the text is too simple and did not trust the glosses. Second, the text might be too difficult and the glosses were essential to process the text. It was also concluded that those participants with greater average proficiency might have adequate target language competence to create efficient utilization of the glosses presented. In both cases, it was vital to carefully select the text to assess the value of the glosses. In the present study, the researcher tried to state this issue through a strict protocol to select the texts. Similar to the retention of words, the researchers showed the posttest dominant performance was probably caused by the nonexistence of exposure within the four-week interval between the follow-up and first tests.

Nation (2013) indicated that "gloss is a short synonym or definition in L1 or L2, which is presented with the text" (p. 174). Several researchers have denoted some benefits of utilizing gloss types while reading. The first advantage of utilizing gloss types is that they assist readers to more precisely comprehend novel words by avoiding incorrect guessing because it is difficult and risky to derive the meaning from the context due to the lack of language or reading policies for the readers (Hulstijn, 1992; Nation, 2013). Moreover, different types of gloss can assist readers relate new information in the context to their former knowledge. Besides, by the glosses, the learners obtain higher autonomy and are less dependent on their teachers because they can find the vocabularies, the meanings of which they do not know (Jacobs, 1994).

Some studies were performed about the effects of glossing types on improving comprehension of L2 language reading. No considerable effect was found for glossing in

second language reading comprehension (Davis, 1989; Jacobs, 1994; Ko, 2017; LeBlanc & Bell, 2000). Some studies proposed that glosses are effective for such readers. Considering the positive results of the effectiveness of gloss, studies changed their concentration from impacts of gloss to types of gloss (Watanabe, 1997). Furthermore, it was attempted to stipulate further positive learning effects of gloss types. One of the issues on gloss types is the question that which type can improve the reading comprehension of the students better than the others?

Chang (2002) studied 92 participants in twelfth grade reading a text under three circumstances: read the text with electronic dictionaries, read the text with L1 marginal glosses, and read the text with no gloss types. Three vocabulary tests were given to the participants after reading 16 target words along with one test for reading comprehension. After two weeks, vocabulary posttest was taken from the participants. The findings indicated no considerable difference in the reading comprehension test. Nevertheless, on incidental new word learning, it was revealed that glosses imposed higher impacts in comparison to the immediate test that electronic dictionaries were used. On the delayed test, the positive effects generated by the gloss types disappeared for retention. The subjects reading with L1 glosses obtained 17% of the target words and retain 2%; those with electronic dictionaries could obtain 14% and retain 4. Moreover, those without any assistance obtained 4% and retain < 1% (0.7%) of the target vocabularies. Learning can be facilitated by the existence of both verbal and pictorial cues, particularly when the related verbal and visual displays are present in the working memory (Jones, 2003; Mayer, 2001).

According to Jones (2003), participants revealed that images required deep processing compared to verbal translations since they had to comprehend the meaning which is not essential if they observe the translation immediately. Based on the quantitative results, the students accessing pictorial annotations revealed higher incidental vocabulary learning compared to those not accessing this type of annotation. Other researchers maintained that if the context of an oral or written passage was not clear from the beginning, incidental vocabulary learning may be failed by deeper processing, and students without access to detailed information would implement incorrectly the risk of learning vocabularies (Hulstijn, 1992; Jones, 2003; Plass & Chun, 1996).

Reading Comprehension and Vocabulary Knowledge

According to the social and economic needs that reading comprehension serves, vocabulary knowledge can be named as the most essential skill that language learners need. This skill involves different levels of processing, which makes reading comprehension a complex skill. In a simple definition, reading is seeing the graphic representation of words on

a page and extracting meaning from these symbols. But in a deeper sense, it involves the interaction of different levels of processing. Through this skill, readers make interactions between linguistic knowledge and conceptual cues that are in the text. Reading can be viewed as the procedure of perception and recognition of the written material (Jung, 2016).

On the other hand, understanding is the comprehension of the meaning of the written material and includes strategies leading to understanding. In other words, reading copes with language form, whereas comprehension, the end product of the reading, deals with the content of the written language. It is the end product of the reading procedure and is what happens when all of the components interact successfully. Therefore, one of the fundamental features of comprehension is the capability to cope with unfamiliar words encountered in text, and text comprehension is one of the main challenges of the cognitive process. Comprehension was viewed, by Jung (2016), as constituting not only the ability to remember content, but also the ability to understand and be aware of the communicative purpose present in a text. Understanding the information is not a goal but a way into fuller command of using the language (Chen & Teng, 2017).

According to studies conducted in the field of reading (Ramezanali, 2017; Teng, 2018; Webb & Chang, 2015), it has been approved that vocabulary knowledge plays a central and pivotal role in comprehending the context. Previous research indicated that second language readers heavily rely on knowledge of vocabulary, and the nonexistence of vocabulary knowledge is the largest obstacle for them to overcome. Some researchers (Babaie & Razmjoo, 2015; Eshghavi, 2020; Ko, 2017; Nation, 2013) have investigated the association between word knowledge and reading comprehension used vocabulary size as a predictor variable for reading comprehension.

The association between reading comprehension and vocabulary knowledge is not one-directional, it can be said that as vocabulary knowledge helps to comprehend a text, reading also contributes to vocabulary growth. Many studies have focused on the connection between reading comprehension and word knowledge. Some of them will be introduced here as a literature review in this area.

Some researchers (Coady & Huckin, 1999; Eshghavi, 2020; Laufer & Rozovski-Roitblat, 2015; Ramezanali, 2017) believed that word knowledge is the most necessary and vital component in reading comprehension, and agree that vocabulary knowledge is a prerequisite for comprehension. With word knowledge, decoding is facilitated as the main part of the reading (Coady & Huckin, 1999).

Jones (2003) believed that the quantity of unfamiliar and familiar vocabulary is one of the most considerable elements in discriminating the complication of a text. As Gardner (2011) indicated, the association between vocabulary and reading comprehension is a strong one which means that knowledge of vocabulary is the predictor of the difficulties of a text. Lin (2015) argued that without knowing and understanding vocabularies of text, no comprehension, either in L1 or in L2, takes place. Reader's familiarity with the keywords of a particular text as well as utilizing reading comprehension approaches may lead to a better comprehension of the text. Furthermore, Chang (2002) found a robust association both between reading comprehension and vocabulary as well as between primary print knowledge and reading rate. He proposed that by incrementing the number of unknown vocabulary in a certain text, the possibility of comprehension of the text reduces.

Reading research also steadily approved that knowledge of vocabulary had a key role in comprehending written texts. Also, having adequate content words assisted students to understand their reading task more easily. On the other hand, few words for comprehending a reading text failed to obtain knowledge of vocabularies since they could not remember and infer the meanings of the unfamiliar vocabularies (Coady & Huckin, 1999; Gardner, 2011; Laufer & Rozovski-Roitblat, 2015).

Definition of Gloss

The idea of glossing is rooted in the past when the readers encountered problems with comprehension of unfamiliar texts like Latin (Jung, 2016). Traditionally, glossing was denoted as a short description or note for facilitating reading understanding for language learners (Lomicka, 1998). Nevertheless, glosses were differently defined based on their different functions to assist learners to make out the text by presenting further knowledge in precise skills, content, definitions, and approaches of difficult vocabularies (Ko, 2012). Lomicka (1998) indicated glossing as normally placed in the margins of a text (p. 41) and as often provided for known words assisting to hinder continuous use of the dictionary and interrupting the reading comprehension processes (p. 41). AbuSeileek (2011) referred to glossing as the addition of notes or comments regarding difficult words, ideas, or phrases to present their meanings or definitions in a specific context (p. 260). Based on the interpretation of Lomicka (1998) on glossing, the glosses are effective regardless of their location and utilization, and they may tolerate various types of information like geographical historical references, cultural, and guiding questions (AbuSeileek, 2011; Lomicka, 1998). Furthermore, "glosses were defined by Cross and Stewart (1991) as a link between prior knowledge of the learners and new data" (p. 5). Roby (1999) indicated that glosses are much more than explanations or translations of

difficult words. Roby (1999) rephrased the linking description of glossing as "a metacognitive gloss" (p. 95) to enhance the reading comprehension of the learners. Ultimately, Roby (1999) referred to glossing as different types of "attempts to supply the deficient points in the declarative or procedural knowledge of a reader" (p. 96). Procedural (skill) knowledge demonstrated is the procedure of performing something, whereas declarative (factual) knowledge indicates the factual information of an individual.

Totally, regarding the vocabulary learning settings, glossing normally denotes that further information about difficult, technical, or important words through examples, translations, synonyms, and/or definitions of unknown words in the first language or second language of EFL learners (Nation, 2013), near the unknown words or at the end of the text (Erçetin & Türk, 2014). Based on the studies on glossing, it is deduced that glossing is beneficial over traditional methods of vocabulary learning, like word-lists, teacher materials, and dictionary use, inferring, and guessing meaning from context, for long term word retention, and L2 vocabulary development (Biria & Farvardin, 2012; Cheng & Good, 2009; Erçetin & Türk, 2014; Hong, 2010; Hulstijn, 1992; Ko, 2012).

Glosses and Their Functions

In the previous section, it was mentioned that knowledge of vocabulary has a key role in the reading comprehension process. By incrementing the number of unknown words in a text, less comprehension may be observed. In response to this problem and many other shortcomings derived from the lack of word knowledge which EFL learners encounter during the reading comprehension process, Nation (2013) highlighted the significance of glossing as an assisting factor decreasing this problem. The meaning provision of unknown words helps learners comprehend the text, guess or infer other important words' meaning.

Regarding vocabulary learning environments, generally glossing provides further information about difficult, important, and technical vocabularies at the end of the text or beside the unfamiliar words (Erçetin & Türk, 2014). According to research on gloss, it is concluded that glossing has more advantages for long term vocabulary retention and vocabulary development over traditional vocabulary learning techniques, such as using a dictionary, list of words, materials of teacher, guessing and inferring meaning from context (Biria & Farvardin, 2012; Cheng & Good, 2009; Erçetin & Türk, 2014; Hong, 2010; Ko, 2012).

Glossing generally provides information on significant words through synonyms or definitions (Nation, 2013; Shiki, 2008; Yanguas, 2009). Scholars explained glossing in quite similar ways. Cross and Stewart (1991) define and contend that glosses are used mostly in

content area reading texts. Glosses were defined by Lomicka (1998) as short notes or definitions to facilitate comprehension and reading processes for L2 learners (p. 41). Gloss is determined as a brief synonym, definition, or explanation of meaning of words in the first or the second language (Nation, 2013). Segler, et al. (2010) explained glosses as brief explanations or translations of technical terms and classified them into textual glossing, pictorial glossing, aural glossing, and different combinations. According to Roby (1999), glosses are several types of efforts to quantity the deficient perceptions in a declarative or procedural knowledge of a reader. (p. 96).

Researchers (Davis, 1989; Huang, 2003; Jacobs, 1994; Khezrlou & Ellis, 2017) normally agreed that using vocabulary glosses in second language reading resources is a usual practice, and glosses facilitating reading comprehension and vocabulary learning. Glossing is an efficient way to assist EFL learners to understand reading materials easily in EFL contexts and classrooms. In comparison to utilizing a dictionary, which interrupts the reading process and is time-consuming, using gloss is simple and minimizes the interruption of reading flow. For this reason, glossing can be a substitute for dictionary use. By presenting additional information beyond the text, glossing guides learners as a tool and mediates between the text and language learners. Lin (2015) stated that the glossing strategy is the most usual adaptation of text form since it helps the reader to comprehend phrases and words; thus, it assists second language learners to understand the reading materials.

As Jung (2016) pointed out, the two most significant reasons for using glosses are to enhance reading comprehension and vocabulary learning. Ko (2012) pointed out some of the benefits of glosses. First, access to glosses is simple in comparison to the dictionary. Second, glossing, by drawing learners' attention to the word in question, increases awareness and strengthens input, and improves attention. According to Jung (2016), a reason for utilizing glosses is to prevent improper guessing. The second reason is to minimize interruptions during reading. Improving comprehension and memorizing the text by activating background knowledge and linking it to the new text information is the third case. Besides, glossing assists to connect the text and background knowledge because of recalling whatever the learner knows already. Jung (2016) also contended that glosses foster autonomy.

Different Categorizations of Glossing

According to Chen (2016), different categorizations of glossing exist in terms of various aspects that include form, position, and language. The form-based categorization involves textual, multimedia, and pictorial glosses. Furthermore, there can be traditional single glossing (SL1) versus multiple-choice glossing (MCG), proposed by Hulstijn (1992); in which the

readers are provided with more than one definition, translation, or synonym for each target word, and they can choose the best alternative. Another categorization according to gloss forms is meaning inferred-glosses versus meaning-given ones. The readers had better performances on word gaining, word retention, and reading comprehension when they were informed by MG (Warren et al., 2017).

Chen (2016) made a comparison on the impacts of the first language (L1) and second language (L2) glosses on incidental vocabulary learning within a multimedia setting. The participants were 190 EFL university students under 4 circumstances of first language gloss, second language gloss, L1 textual gloss, pictorial gloss, and L2 textual gloss and pictorial gloss. The study material was a story with 380 words, of which 22 were glossed, 15 were target words, and 7 were familiar words. It was proved that first language (L1) and second language (L2) glosses were efficient in improving vocabulary learning and effective for incidental learning. However, regarding long term retention, it was shown that the first language textual glosses resulted in better retention results in comparison to pictorial glosses or second language textual glosses.

Teng (2018) made a comparison on the effects of meaning-given and meaning-inferred glosses on incidental word learning of the learners. The participants were 165 students with low and high levels of proficiency. Based on the findings, the attention of the learners was promoted by facilitative effects of glossing on vocabulary learning. The researchers also found that meaning-given and meaning-inferred glosses can result in incidental vocabulary learning in reading focusing on meaning. However, the gloss inferred by meaning was considered to be more effective in vocabulary retention and gain.

The impacts of vocabulary assistance were compared by Chen (2016) in various locations. The subjects were 74 undergraduate university students who read an L2 newspaper article with vocabulary support before reading, while reading, before or during reading, and without any assistance. It was deduced that students receiving vocabulary assistance while reading performed better than those receiving it before reading. Chen (2016) offered two reasons to support reading vocabulary. The first one is the empirical support for activities that take place over reading contrary to theoretical support for activities that take place before reading. The second reason is better regulation of individual differences.

Rassaei (2017) studied the audio gloss with textual glosses and L1 definition regarding the effects of the visual perceptual styles and two auditories on EFL learners' word learning. The results indicated the efficacy of two glossing forms for vocabulary learning. The results of the study also revealed that the visual learning group was outperformed by the subjects

classified in the auditory group receiving the new words via the audio, and instructed via pictorial glossing mode. Moreover, the determining and prominent role of learners' preferences for vocabulary learning and auditory-visual learning style was signified. The idea of combining the instruction mode with perceptual learning modes was further supported by the dominance of audio mode for the auditory group.

Glossing and Language Proficiency

Language abilities such as "glossing" help students to attain better outcomes in speaking, listening, reading, and writing, and the language ability can be referred to as language proficiency. As it is said before, if we know more words in the reading comprehension process, more comprehension will take place.

As Lin (2015) stated, it is essential to consider the proficiency level of the learners into reading ability. Lin (2015) also indicated that the level of proficiency of learners might affect MG since it controls the adequate knowledge of the learners for the context words and determines their inferring skills.

It is believed that language learners with different language proficiency enjoy various types of glossing (Acha, 2009). Rott (2007) indicated that the L1 glossing should not be used by the researchers for second language learners with advanced levels of proficiency, and teachers should keep on using L2 glossing.

The computer-assisted language learning (CALL) studies (Bowles, 2004; LeBlanc & Bell, 2000) report that quantitative findings suggest insignificant utilization of other types of glossing on L2 reading understanding by L2 readers. First and second-year learners able to choose between L1 and L2 glossing normally select the L1. If students' proficiency level is sufficient to comprehend the definitions in the target language, L2 gloss can be further efficient compared to the L1 gloss (Ko, 2017).

Hong, Dufon, and Jacobs (1994) tested the intermediate students studying Spanish and found that glossing did not considerably influence recall. However, students with an above-average proficiency in a second language showed a higher recall while utilizing glosses. Briefly, the authors believed that language proficiency has an interactional effect with the gloss, including the gloss type and the language of the gloss. For example, the students who have higher proficiency prefer the MG to the SG (Watanabe, 1997).

According to Ko (2012) and Williams et al. (2002), higher proficiency facilitates students' learning of more vocabularies during multiple-choice glossing (MCG) conditions, and they can overcome the word threshold limitations associated with L2. In sum, second language

gloss (L2) was more operative for learners with higher proficiency level; yet, first language gloss (L1) was more operative for learners with lower proficiency (Miyasako, 2002). The main concern is their proficiency level, indeed, gloss in English (L2) may not assist but rather causes many difficulties in comprehending the text. Moreover, the readers' proficiency could also influence the effectiveness of the two gloss types (e.g. MG SG). MG (i.e. inferred meanings) in readers' L2 seemed to have induced cognitive effort and distinctive trace in memory for higher proficiency students, but it was not as effective for lower proficiency students (Watanabe, 1997).

LeBlanc and Bell (2000) examined the actual behavior of language learners to determine which gloss type is more frequently used for reading based on computers. Fifty Spanish students were classified into two groups. The passage was a short story with glossed vocabularies. One group read the text with Spanish glosses, and the other group read the same text with English glosses. The subjects read the text on their computers where the target words were highlighted and underlined. Another screen opened by clicking on the underlined word including the gloss information and the target word. A tracking system existed for recording each hit on the page. After reading the text, a reading comprehension test was performed directly for the participants. The results indicated that the readers had a preference for utilizing glosses in their mother tongue. Based on the results of the comprehension test, the participants preferred first language glosses (L1) over second language glosses (L2). The difference between the Spanish gloss group and the English gloss group was not significant statistically.

Chen (2016) assessed the same issue on the subjects learning English as a second language. In his study, 55 college students were classified into three groups: Chinese gloss (L1), English gloss (L2), and one control group without any gloss. They read a text with glossed words. It was found that there were no significant differences between Chinese and English gloss groups, and the control group was outperformed by the second language gloss group.

Empirical Studies on Glossing

Recently, the research focus of this area of investigation was changed from investigating whether glossing has any significant effects on reading comprehension to the question on the more effective type of glossing (e.g. L1 or L2) for language learners and readers through reading material. In other words, the main issue of this area of research is determining the more efficient types of glossing for reading comprehension tasks and processes.

Numerous studies have shown the impacts of glossing on reading comprehension. These efforts brought mixed and inconsistent results. Studies showed that reading & comprehension

are facilitated by using gloss, and reading comprehension efficiency is enhanced (Arpaci, 2016; Chen, 2016; Huang, 2003; Ko, 2017; LeBlanc & Bell, 2000), and in other studies, no significant effect of any type of glossing was reported. It was indicated that glossing has less or no impact on reading comprehension process (Ko, 2012; Yoshii, 2014).

Previous Studies on Glossing: No Significant Difference Between Gloss Groups

Milton (2009) investigated the association between text comprehension and L1 gloss. They presented a glossing or complete printed translation for the participants for the first time. The participants were 120 students taking intermediate courses in French and were divided into 3 groups. Only, the passage without translation was presented for the control group; however, one of the groups listened to the audio and the other group read the text with no audio. Parallel translated texts were provided to the second and third groups. The subjects were requested to answer 10 multiple-choice questions in French. No considerable difference was reported between the groups; however, these two groups performed better than the control group. Besides, analysis indicates no considerable difference between the scores of the higher proficiency level students and in the parallel translation group, the low proficiency level students outperformed their counterparts in the control group.

In one of the associated studies, LeBlanc and Bell (2000) made a comparison for two types of glossing typically utilized for computer-based reading. Forty undergraduate students in the third semester studying Spanish were the participants. They were allocated into two groups of the first language (L1) gloss and second language (L2) gloss. A comprehension test of multiple-choice (MC) test was run after reading a text. The results indicated no considerable difference between the L1 gloss group and the L2 gloss group. The findings of the questionnaire analysis also revealed that the subjects favored L1 gloss over L2 gloss.

In another research, Chen and Truscott (2010) studied Taiwanese students studying English as their second language. They were randomly divided into three groups; the first language gloss group, the second language gloss group, and the control group. The participants were requested to read an English text with target words. The results revealed no significant differences between the L1gloss group and the L2 gloss group, however, the second language gloss group acted significantly better than the control group. Chen and Truscott (2010) reported similar results between L1 glosses and L2 glosses as reported in Jacobs' (1994) study. The researcher indicated that the second language gloss group spent more time reading the modified text than the first language gloss group did. According to previous studies, slower reading could lead to less automatic recognition of words recognition and less text comprehension.

Sato (2016) conducted a study on the L1 translation effect on young learners' storytelling. Participants in this study were 40 students, all between 10 and 11 years old. They were classified into two control and experimental groups. The groups were trained in different ways of teaching explicit vocabulary. The control group was taught only in English and the experimental group received L1 translation training in the selected lexical items. Explicit vocabulary teaching using storytelling is used to find out whether the use of L1 in new words teaching helps learners access and memorize new words beneficially. The pretest consisted of twenty story items. They were divided into three sections so that the participants could make immediate decisions. The posttest was performed with the same pretest format for both groups to evaluate the effect of vocabulary learning concerning the pretest. The outcomes showed that providing lexical equations in L1 helps students to access and memorize more lexical items, and remember them for a long time.

Yoshii (2006) assessed the efficiency of the first (L1) and second language (L2) glosses on vocabulary learning. The participants were 195 college Japanese students learning English as a second language. They were classified into four groups. The first group possessed text-only glosses in their mother tongue (L1). The second group possessed text-only glosses in the target language (L2). The third group had the text with pictorial glosses (L1). The fourth group had the text-plus-pictorial glosses (L2). A story was read by the subjects on the computer with highlighted glossed words. By clicking a word by the participants, a gloss was seen on the right side of the screen. The gloss and the picture were seen on the screen by the text-plus-picture glosses. The students received two posttests. One of the posttests was given directly after reading the passage and the other posttest two weeks later. The results revealed no considerable difference between first language and second language glosses in the two tests.

In another study, Cheng and Good (2009) examined the impacts of different gloss types on vocabulary retention, such as second language (English) glosses, first language (Chinese) glosses, L1 (Chinese) in-text glosses, L1 (Chinese) marginal glosses, and no-gloss situation. The subjects had given a reading passage, a pretest, a posttest, and a delayed vocabulary test. It was indicated that the learners were helped by L1 glosses for learning new vocabulary. No considerable differences were found between groups in reading comprehension. In addition, the researcher requested the participants to express their opinion on utilizing gloss through a questionnaire. Analyzing the questionnaires showed that most of the learners possessed a positive attitude towards glossing: 60 percent of them indicated that the glosses could increment vocabulary learning and reading comprehension during the study, however, their opinion about the effectiveness of gloss was more accurate for vocabulary learning compared to the reading

comprehension. Moreover, 40 percent of the subjects believed in first language (L1) glosses plus second language (L2) sentences as the best way to learn new words.

To determine what effects would be found based on the readers' language proficiency and the two different types of gloss (SL1 & SL2), Marefat, et al. (2016) conducted research with 85 college students of different language proficiency. The participants took a pretest that included 45 meaning-matched items corresponding to 45 target words in two reading passages. Next, they read the texts with a single gloss and the other test with a multiple-choice gloss. Next, the participants immediately took a comprehensive question test. Four weeks later, the researcher administered posttests to the participants. It was showed that gloss types had no considerable difference in word learning and reading comprehension, and also no significant differences were observed between the gloss types and language learning on vocabulary learning.

In a study, Azari (2012) examined the effect of different types of glossing on the reading comprehension of low proficiency students. In this study, there were 70 EFL learners. They were divided randomly into four groups. In the study, there were three experimental groups and one control group. A reading passage was given to the participants that included six authentic texts. Gloss conditions for this study included: first language and second language gloss (Persian and English), L1 gloss (Persian), L2 gloss (English), and the participants in the control group read the text without glosses. Results of the study showed the advantage of textual glosses over the no-gloss conditions. The findings revealed that a considerable difference was found between the experimental groups and the control group. No considerable difference was found between L1 gloss, L2 gloss, and L1 and L2 gloss.

Rassaei (2017) carried out a study to assess the effects of glossing, no gloss, L1 gloss, and L2 gloss on word retention and vocabulary learning. There were 65 intermediate-level students taking part in this study. The students were classified into three groups: the first group read a text with new vocabularies in L1 gloss (Persian); the second group read the text with L2 gloss (English), and the third group received a text without any gloss. In the end, a vocabulary test was taken for groups. Posttest and pretest designs were used for the purpose of the research. Comparing the three groups indicated a notable difference between first language (L1) and second language (L2) gloss groups for the group with no gloss conditions. Nevertheless, no considerable difference was found between L1 and L2 glossing. EFL students possessed a positive attitude toward first language vocabulary glossing.

Previous Studies on Glossing: Significant Differences Between Gloss Groups

Davis (1989) was the first researcher to write an article regarding first language (L1) gloss and reading comprehension with a control group. The participants in his study were 72 American students of French who were divided into three groups randomly. Each group was given a 920-word French story to read under one of the conditions. A text was given to the subjects in the control group, and they were requested to read the text and write whatever they remembered, then read the text again and edit the recall protocol. The subjects in the second group had to read a list of phrases, expressions, 25 words, with directing comments and questions as they study. Reading the text for 20 min, they should write the protocol. The same materials provided to the second group were presented by the researcher in the glossed form to the students in the third group. They were also requested to read the text with gloss and write down the recall protocol. According to the outcomes, the group with L1 gloss (third group) performed better than the second group, and they performed well compared to the control group.

In another study, Jung (2016) compared the L2 reading comprehension of Korean university students. In the study, there were five conditions: 1) in the first condition students read the first language glossed texts with translation of vocabulary. 2) In the second condition, the L2 glossed texts were read by the students with vocabulary explanations in the target language. 3) In the third condition, students read texts without any type of gloss. 4) In the fourth condition, there was traditional instruction with oral translation. 5) In the fifth condition, there was only instruction in English. Based on the outcomes, the first language gloss group acted better compared to the other groups and the traditional instruction groups, and the L2 gloss group acted better compared to the English-only instruction groups and control group.

In another study conducted by Ko (2012) the impacts of glossing on second language (L2) reading comprehension were analyzed. The test was administered to undergraduate students in Korea. Among the participants, some students were selected to think aloud. The other students were allocated in three groups: the control group, the L1 gloss group, and the L2 gloss group. They were given a text with multiple-choice questions. They were asked to read the text and then answer a questionnaire. The results indicated that the second language gloss group acted better than the other groups in reading comprehension test. In addition, the findings of think-aloud protocols showed that the first language gloss group and second language gloss group performed better than the control group in reading comprehension test. Although no meaningful differences were found between the control group and the L1 gloss group, the L1 gloss had the ability to enhance reading comprehension. Analyzing the questionnaires indicated that the subjects preferred L2 gloss.

Ko (2005), in his study, used qualitative and quantitative measures to investigate whether different kinds of gloss circumstances affect students' reading comprehension. Korean undergraduate students took part in the study. Some of the participants were asked to think aloud, and the other students participated in the main study. There were three conditions in the study. There were three groups in the study: a control group with no gloss, a Korean gloss group, and an English gloss group. The students took a multiple-choice test after they read the text, and answered a questionnaire. The results of the study showed that the reading comprehension of the students was affected by only the L2 gloss conditions. Nevertheless, the think-aloud protocols showed that the students liked the first language (L1) glosses, and they thought it would allow them to understand the text more easily while reading.

Al-Ghafli (2011) studied the impacts of gloss types on reading comprehension and idea recall of 90 undergraduates. The participants randomly read the texts under three conditions: first language gloss (Arabic), second language gloss (English), and a control group without any gloss. An English text was read comprising glossed words. The reading comprehension test revealed the advantages of the first language (L1) glosses over the second language (L2) glosses.

Mohsen and Balakumar (2011) investigated the impacts of multimedia glossing on acquiring English language words with two groups (experimental group & control group). In the study, the reading passage was received by the experimental group via multimedia software via texts, images, and audio. The control group had the same passages where the words had definitions only. A questionnaire about attitudes towards using multimedia software was given to the participants in the multimedia gloss group, and they were asked to complete it. The immediate and delayed vocabulary measurements investigated that the group that had multimedia glosses acted better compared to the group that had no electronic glosses. It means that the target words were learned better when they were presented with texts, audios, and images than when they were learned without gloss types. The results of the study contribute to the effect of multimedia gloss on second language vocabulary learning and approve the studies using a combination of modes like text, images, audio, and videos. Using a variety of media also helps learners learn vocabularies better than one-mode presentation.

Shams and Tabatabaei (2011), in their study, investigated the effect of glossing on listening and reading comprehension of EFL learners in Iran. The aim of the study was to ascertain if first language or second language marginal glossing may cause any difference in second language reading and listening comprehension. For this purpose, females learning English as a foreign language were randomly selected and were divided into two groups. The

students must take two TOEFL tests. One of the tests was a pretest to guarantee their homogeneity in language skills, and the other one to investigate the glossing effect on their listening and reading comprehension. The study showed a considerable difference between the two groups receiving English and Persian glosses. In addition, the study showed that the class receiving the Persian gloss (L1) performed better than the class receiving English gloss (L2) in listening and reading comprehension tests.

The computer-based visual effectiveness of glosses on Japanese students' word learning was examined by Sato (2016). Using a cognitive linguistic schema, the study suggests that "our perceptions are meaningful since they are rooted or embodied in our bodily experiences" (p. 44). In the study, two experimental and control groups existed. The three abstracts were received by the groups through animated and pictorial gloss forms. A pretest was performed for assessing the knowledge of the participants about using prepositions in a proper context. Finally, the two delayed and immediate productive and receptive vocabulary tests were also performed for measuring the performance of L2 learners on using prepositions. According to the results, there was no difference between the two groups. Nevertheless, the pictorial gloss had a positive effect on reading comprehension. Thus, using images facilitated language learners' sentence production with target prepositions.

Acha (2009) conducted a study on the fourth-grade students to evaluate whether visual and verbal glossing modes (picture gloss, definition in L1, or combination of them) affect participants' word learning in the long term and short term. After two weeks, the results of the study revealed that the L1 gloss was beneficial for word retention and learning than the visual mode.

In an investigation, Ramezanali (2017) assessed the impacts of three kinds of glosses on learning the vocabularies to explore which types of gloss can facilitate vocabulary learning and word retention. Intermediate level students studying at University participated in the study. One control and 3 experimental groups were made by 132 intermediate language learners. The target words were received by the experimental groups in various glossing modes, and no glossing instruction was received for the control group. In that study, using ANOVA, Kolmogorov-Smirnow test, and post hoc comparison the pretest, and posttest data were analyzed. The perceptions and attitudes of the learners towards glossing modes were assessed as well via interviews and a questionnaire. Based on the results, glossing was more effective compared to the non-glossing approach for short term retention of the participants in multiple-choice productive recognition and productive recall tests; and effective to some extent for the long term remaining of the word in the memory. Furthermore, in both vocabulary measurements, for

most test sessions, video/animation glossing, L2 definition as well as audio and L2 definition glossing could be more impressive compared to the second language definition alone. However, it is not possible to generalize the results largely since the L2 definition alone was also operative for few test sessions. The results of the interviews and questionnaire indicated that the participants favored video/animation glossing and L2 definition rather than the two other styles.

In another study, Marzban (2011) studied the effects of marginal glossing on the reading comprehension of language learners. In other words, the study aimed at observing whether English or Persian lexical glossing bears any effect on the listening and reading performance of language learners. Analyzing and gathering the data indicated that as far as both listening and reading skills were concerned, there was a considerble difference between the performances of the groups. The results of the study showed that the students who received L1 glossing (Persian) performed better than those students who received L2 glossing (English).

Khezrlou and Ellis (2017) examined the effect of learning circumstances (incidental learning, explicit learning, and intentional learning) on new word learning and reading comprehension of FL learners. The participants of the study were receiving glossed instructions in the audio, image, and text forms (multi-glossary mode). The vocabulary tests showed that regardless of the context in which words are learned, there was a great benefit to all the participants. Besides, explicit word training was the condition assisting the students to long term memorize the words. Nevertheless, based on the reading comprehension tests, the outcomes were different based on the test types. Generally, the study supported explicit and intentional instructional learning over the incidental learning conditions. Furthermore, the target word learning was facilitated by using multi-glossing although the learners made no deliberate efforts to learn the words (Khezrlou & Ellis, 2017).

Given these results of the research, and since there are no proven results regarding the effects of gloss on reading comprehension of EFL learners and teaching context, more studies are needed to be carried out in this field.

CHAPTER THREE

Methodology

Overview

The aim of this study was to investigate the effect of L1, L2, and pictorial gloss on EFL learners' vocabulary learning which is done by providing a structure-based, textual, and meaningful word-learning environment. The present study combined the elements of qualitative and quantitative research approaches, and used a mixed methods research methodology (MMR). Next, the setting and the participants were clarified.

The chapter continues with the presentation of data collection instruments, administration, reliability, and validity of these tools. The subsequent sub-section presents a step-by-step narration of the data collection procedure. Then, the methods for both qualitative and quantitative data analyses are explained. Finally, the role of the researcher in the data collection and data analysis procedures is clarified.

Design of the Research

The decision-making process about the appropriate method and its theoretical underpinning is an important accuracy component in a research design. In this study, the mixed method research design is used.

The Rationale for Using Mixed Methods Research Design

Mixed-methods research (MMR) is obtained from a combination of quantitative and qualitative methods of research, which shows different research forms in the same research, and sometimes is referred to as the third paradigm of methodology (Tashakkori & Teddlie, 2009; Venkatesh et al., 2013). According to Onwuegbuzie and Johnson (2004), the mixed method design is the type of research in which the researcher combines qualitative and quantitative research approaches, concepts, methods, or techniques in one study.

There are several names for the mixing research methods in the literature such as triangulation studies, mixed research, multiple methods, blended research, and multimethod (Venkatesh et al., 2013). Convergent parallel design is mainly performed to contrast and compare the outcomes obtained from qualitative data and quantitative data sets and to validate, strengthen, or confirm the qualitative results with the results of the quantitative data. In addressing the main issue of research in this type of study, qualitative and quantitative research

methods are given equal priority (Venkatesh et al., 2013). The present study used convergent parallel design as a mixed methods research design. Qualitative and quantitative data were collected simultaneously. The analyses of both data sets were kept separate, then the data were mixed for general explanation of the outcomes.

In this study, while comparison of the effect of different types of gloss on EFL learner's word learning in the quantitative dimension of the study, the data gathered from the questionnaire and face-to-face interviews, in which the participants represented their comments, views, and opinions constitute the qualitative dimension of the study. In the study, qualitative and quantitative data were collected simultaneously. However, the data set analysis was performed separately. The findings were then interpreted.

The findings of qualitative and quantitative components help to show how glossing affects EFL learners' new word learning and helps them to improve long term and short term vocabulary memorization. In the case of triangulation, because the research approaches were in line with the research questions and had similar conclusions, the researcher was more confident in the findings.

The advantages of using mixed method research over quantitative or qualitative research methods in a study (Tashakkori & Teddlie, 2009) include that the mixed method research gives a chance to the researcher to study the research questions through one lens of research method and complement the findings with another method.

Researchers have also shown that mixed method research is a recommended research method for the following reasons (Onwuegbuzie & Johnson, 2004; Ramezanali, 2017; Tashakkori & Teddlie, 2009; Venkatesh et al., 2013). The first reason is development; it means using the findings of one methodology to know about a project that uses another methodology. The second reason is completeness; it means mixing a comprehensive research area by using quantitative and qualitative approaches to enhance the phenomenon understanding and combining several theories and methods to examine the results. The third reason is the initiation that means discovering differences and discrepancies in research results that may change the form of research questions. The fourth reason is complementarity that means the implementation of one-method findings to show and clarify the other results of method. The fifth one is expansion, which means using different methods to generalize the breadth and depth of the research. The sixth reason is diversity; it means utilizing different methods to combine the views of participants and researchers through quantitative and qualitative research to identify different perspectives on a phenomenon. Finally, the seventh reason is confirmation,

which means making new hypotheses needs qualitative data, and to test them in a single project, quantitative research is used (Onwuegbuzie & Johnson, 2004; Tashakkori & Teddlie, 2009).

The rationale of using the mixed method as the design of this study is that its advantages have been recognized by researchers in both education and leadership studies. As Dornyei (2007), for instance, argues:

> *"The understanding of the operations of complex environments – such as classrooms – lends itself to mixed methods research, because combining several research strategies can broaden the scope of the investigation and enrich the researcher's ability to conclude"* (p.186).

The reason why the researcher chose a mixed method approach for this study was due to her desire to produce valuable and useful findings for the participants in this study, and language learners who learn English as a second language (ESL).

Generally, the researcher tried to use the convergent parallel design in this study for triangulation and complementary reasons. In the complementary aspect, the findings of qualitative and quantitative components help to show how glossing affects EFL learners' new word learning and helps them to improve long term and short term vocabulary memorization. In the case of triangulation, because the research approaches were in line with the research questions and had similar conclusions, the researcher was more confident in the findings. Besides, by using triangulation, the researcher was able to increase the validity of the qualitative data and the research tools to measure the effectiveness of glossing in word learning and retention of EFL learners (Tashakkori & Teddlie, 2009).

From the methodological point of view, the researcher used within-and-between participants' designs (Ramezanali, 2017) for analyzing the data and answer the questions of the research.

By using a between-participant design, the researcher can compare all groups' performance in the study (three experimental & one control group) to examine whether different modes of gloss (L1, L2, & pictorial glossing) have an important effect on vocabulary learning of EFL learners.

The within-participant design included the effect of vocabulary teaching methods in training sessions on vocabulary learning of EFL learners in terms of long term and short term vocabulary learning and retention. The present study consisted of three cluster training sessions during the second week. The students met the researcher online for training sessions three times a week (Sunday, Tuesday, & Thursday). The time interval was one day between the first training session and the next session (from Sunday to Tuesday or Tuesday to Thursday) which

was short term retention. But the time interval was two weeks between the final training session and the delayed posttests that was long term retention.

The reason for using a two-week interval was the work of Bahrick et al. (1993) who reviewed the language learning duration period for collecting and retaining vocabulary more than nine years. The findings of the present study showed that increasing interval of retention from a performance in each study session to 42 days leads to better performance of participants in the tests. In the present study, based on the feasibility and accessibility of the language learners, a 14 days interval was considered as the retention gap.

General Linear Model: Analysis of Duplicate Sizes

When a participant is measured by variables several times over time, the form of such a study is a repetitive measurement scheme. Although the advantages of duplicate tests are obvious (for example, they need fewer cases for test, and such schemes eliminate interpersonal differences from trial error), they often violate multivariate analysis assumptions such as independence. In this study, the researcher used a mixed two-factor design of the general linear model of repetitive measures (one intergroup variable and one intrapersonal variable). Performing repeated measurement tests requires the establishment of assumptions which will be discussed.

Repeated Measures Test Defaults

a. The dependent variable should have a quantitative value.
b. There should be no significant outlier in any of the associated groups of studentized residues.
c. The distribution of the dependent variable in each combination of dependent groups must have an approximately normal distribution (approximate here means that the repeated measures test is somewhat capable of not establishing the normality assumption, and if the normality assumption is not established in some combinations, this test also provides valid and reliable results). The normal distribution can easily be checked using the Shapiro-Wilk test or the Kolmogorov-Smirnov test.
d. Assumption of sphericity, the variance of the difference between all the combinations of the respective groups should be equal. The output of SPSS has provided the relevant results of establishing the spherical assumption. (If the sphericality assumption is valid, the intrapersonal effect test is used, and if the sphericality assumption is not valid, multivariate tests are used). In interpreting the test results, repeated measures of SPSS output are determined based on the significance of

Mauchly's spherical test. If this test is less than 0.05 and is significant, multivariate tests are used, and if this test is more than 0.05 and is not significant, the output of within subjects' effects tests can be used (Leech et al., 2015).

Setting and Participants

The particular institute, where the research data were collected, was chosen due to the accessibility of the researcher. The research was carried out at the private language institution in Iran. The researcher was an English tutor in that institute for 5 years. At the language institute, students were taught French and English. 120 participants from the institute were chosen randomly in the fall semester of the 2019-2020 academic year. The students were teenagers, all aged from 14 to 19 years old. The native language of the students was Farsi (Persian), and they learned English at the intermediate level as the foreign language. The classes in the institute were two times a week (Sundays & Thursdays) from 4 to 5,30 p.m., and the courses were held online because of COVID 19. After class, the students met the researcher online for training sessions three times a week (Sunday, Tuesday, & Thursday) just for thirty minutes. The training session was such that on certain days (Sunday, Tuesday, & Thursday) and at certain times (5.30 to 6 p.m.), the researcher explained the glossing technique to the students. The participants had no prior knowledge of glossing.

The researcher gained access to the research participants after obtaining ethical approval from the institute. Participants of the study were given a form of demographic information, including gender, age, length of study in English at an institution, and what other language they speak other than English. The demographic information was collected to better understand the students when interpreting the data. Filling out the form took 3 minutes for the students (Appendix B).

Descriptive Results of Students' Demographic Information

Table 1 illustrates the demographic information of participating students in frequencies and percentages.

Table 1. *Demographic Information about the Gender of Participants in the Survey*

Variables	Categories	*f*	%
Gender	Male	37	47.5
	Female	43	52.5
TOTAL		80	100

The participants were of different genders, and they were taking the course from two different instructors. Concerning their gender, there were 37 male (47.5%) and 43 (52.5%) female students in the study.

Selection of Participants

The student's level of proficiency was determined by two criteria: (1) placement test of language institute; (2) vocabulary test. Based on the placement test of the institution, the students had studied at the intermediate level. The placement test included written, audio, and face-to-face examination. Expert English language teachers at the institution in the oral interview asked questions from the English File Book (American English File 2, second edition, 2019). It was the primary instructional book at the institute, to determine learners' level of proficiency. Therefore, students who successfully answered most of the questions were in the intermediate level and were accepted as the participants of the study.

In the second stage and as an initial test, a list test of 56 words from the upper intermediate level was prepared and given to the students for the vocabulary test. Students were asked to write the meanings of vocabularies in their Native language (Farsi) or in Target Language (English). The time for vocabulary test completion was 20 minutes. After answering the vocabulary test and according to the participants' answers, 22 target words and 34 distractors were selected out of 56 words.

In the present study, 80 students out of 120 participants were selected according to vocabulary test results. The method of selection was such that those who did not answer the target words or answered only up to 25% correctly were selected.

Table 2. *Table of Gloss Modes*

Group	Modes of Gloss
Group A	L1 Gloss Group
Group B	L2 Gloss Group
Group C	Pictorial Gloss Group
Group D	Control Group (no glossing)

The selected students were divided randomly into four groups, each had 20 participants. The first group was labeled as group A, the second group as group B, and the third one as group C (these three groups were the experimental groups), and group D (control group). The naming process of experimental groups was based on the type of gloss they received during the instructional sessions (Table 2).

Selection of Main Text

The main text was selected according to the target words (i.e., a text was selected that contained all the target words) and was given to the students one week after the vocabulary test. The reading text was: The Secret of Long Life: Interaction 1 Reading (Hartman & Kirn, 2018, pp. 133-135). The text was taken from English books with intermediate levels and was at the skill level of the students participating in the test. Two EFL trainers at the institution agreed that the textual content was appropriate for the intermediate skill level, and the topic was interesting and unfamiliar to the participants.

Four types of reading passages were prepared for participants: (a) a base form with no gloss, (b) a version with L1 definitions of the glossed vocabularies, (c) a version with L2 definitions of the glossed vocabularies, and (d) a version with pictures of the target words. Each text was 573 words in length. 22 target vocabularies were selected as glosses in the study (See Appendices C, D, E, & F).

Table 3. *Text Characteristics*

Title	**The Secret of Very Long Life**
Length (number of words)	573 words
Number of Glossed words	22

It is obvious from Table 3 that each group had to answer questions according to the type of gloss they received. For example, the pictorial gloss group received the image of those words behind the text and had to guess the meaning of the word from the pictures. For the L2 gloss group, the meanings of all the underlined words were written in English on the back of the text. And for the L1 gloss group, the meanings of all the underlined words were written in Farsi on the back of the text.

Data Collection Instruments

The present study has been done with a mixed method design, in which quantitative and qualitative data were collected and analyzed. Different instruments were employed in collecting both types of data, and therefore, quantitative and qualitative instrumentation are explained separately.

Quantitative Data Collection Instruments

The quantitative data collection phase consisted of (a) vocabulary levels test to determine target glossed words as pretest; (b) reading passage prepared in three forms (L1

definition, L2 definition, & pictures); and (c) two immediate and delayed vocabulary measurement tests (Appendices G, H, I, J & K).

In this study, two kinds of tests were used: (a) short term achievement tests; and (b) long term achievement tests. Webb and Nation (2013) suggested that measuring students' new word learning using several tests is valid. Milton (2009) believed that with a single test we cannot measure different features of vocabulary knowledge. Peters and Webb (2018) believed that using both productive and receptive tests to measure one feature of vocabulary knowledge provided a more accurate evaluation of the type and degree of learning. Therefore, two tools were used: the productive recall vocabulary test (PR) and the multiple-choice (MC) test. The students in the PR test must remember the words in questions, and write them in the blank spaces. In the MC test, participants must identify the words and select them from the given choices.

As Nation (2013) stated, production vocabulary tests compared with the recognition vocabulary tests are challenging for foreign language or second language learners. One of the most common vocabulary tests is the definition-based form, in which the researcher asked the participants to give a word definition or to recall it based on the definition. Items of the test were designed based on the target vocabularies selected from the reading passage.

Multiple-Choice tests can effectively differentiate some of the learners' vocabulary knowledge and can be used in a short time by a large number of students. The language learner was required to select the correct alternative form for each definition among one correct item and three distractors.

Example:

What does longevity mean?

a. long length of life
b. a long time
c. the environment of the mountains
d. health and care

Response: item a

Multiple-Choice productive recognition vocabulary measurement tool, similar to the productive recall test, was according to the 22 target vocabularies from the reading text (Appendix I). The criterion for scoring the productive recall test was zero for incomprehensible,

blank, and wrong responses, and one for the correct responses. Participants were given 15-20 minutes to complete each immediate posttest. The test was in pencil and paper format.

The criteria for selecting 22- chosen glossed vocabularies were as follows:

- The glossed vocabularies were chosen according to the unfamiliarity of students with the vocabularies. To achieve this criterion, a list of 56 words was written and given to the students. Students were asked to write the meaning of the words in their Native language (Farsi) or in Target Language (English) and leave blank for the words, the meaning of which they did not know.
- The target vocabularies were chosen according to their usefulness and importance for understanding the reading text. Vocabularies that could easily be displayed through clear and simple text definitions and suitable pictures were selected. The second language explanations for new vocabularies were provided from the Cambridge Advanced Dictionary (Fourth Edition, 2013).
- The glossed vocabularies were explained by first language definitions, second language definitions, and pictorial gloss. All target words were bold-faced and underlined. This kind of textual development indicated that word glossing was available. It provided an opportunity for learners to retrieve mentally and had a positive effect on new word learning and retention (Nation, 2013).

Table 4. *List of Target Vocabularies*

Target Vocabularies	Target Vocabularies
apricots	health club
available	inhabitants
benefits	longevity
Chapatis	mountainous areas
chemicals	nutrition
corn	quiet
countryside	raw vegetables
diet	region
fat	serious
grain	temperature
health experts	Worry

Table 4 indicates the list of the 22 glossed vocabularies which was presented in the study.

Qualitative Data Collection Instruments

The qualitative data collection phase consisted of a questionnaire and face-to-face interviews.

From the qualitative perspective, a questionnaire was used to collect data. According to Colosi (2006), using a questionnaire is one of the common methods for gathering information. The questionnaire was distributed to assess students' perceptions and attitudes towards glossing (L1 gloss, L2 gloss, & pictorial gloss). The researcher used a 5 points Likert-type scale in which the participants rate their agreement with a question typically at five points: (5) strongly agree, (4) agree, (3) neither agree nor disagree, (2) disagree, and (1) strongly disagree.

According to Punch (2011), in qualitative research, interviews are a prominent method of data collection because they provide structures of reality, definitions of situations, and perceptions of people. The interview also has a lot of flexibility to be applied in different situations of research. It can also provide answers about people's feelings, opinions, experiences, knowledge, and perceptions (Punch, 2011). It can be said that through interviews, researchers get a chance to access important data that cannot be obtained by perception (Ramezanali, 2017). In the present study, the researcher prepared a face-to-face interview via video calls in which the participants were asked 9 questions about their opinions about using the gloss technique in learning new vocabularies.

Qualitative Data Collection Procedures.

From the experimental groups (L1 gloss, L2 gloss, & pictorial gloss), sixty students filled out the questionnaire. The students were given a questionnaire with 9 questions. The questions were based on the 5 points Likert-type scale. In this type of scale, number 1 is considered as complete agreement and number 5 is considered as complete disagreement with the subject.

Participants were asked four questions about whether they considered the L1 gloss mode to be an effective and simple way to memorize new vocabulary. Other questions reflected students' understanding toward glossing mode with second language (L2) definition.

In questions 1-3, the participants were asked to express their views on learning new words with L1 gloss, L2 gloss, or pictorial gloss respectively.

In questions 4 to 6, participants were asked in the final test if it was easy to remember a new word when receiving instruction through mother tongue, target language, or pictorial glossing.

In questions 7 to 9, students were given questions about their desire to use different modes of glossing including first language gloss, second language gloss, and pictorial gloss as the future language learning strategies while learning a new vocabulary (Appendix L).

In the final stage of the research, some of the participants from experimental groups were invited for an interview via video calls in order to understand the attitudes of participants and their preferences towards glossing modes (L1 gloss, L2 gloss & pictorial gloss). They were asked some questions about what strategies they use to remember vocabulary, how long they have been studying English, what their opinion is about vocabulary learning through the gloss technique, which vocabulary learning technique (L1 gloss, L2 gloss, or pictorial gloss) they preferred, how the vocabulary learning modes used in the present study have changed the way they used to learn new words, and etc. (Appendix M).

Collecting Data

The study was done in Iran and in an institute for EFL learners. The following stages were considered in the study. The first stage was a pre-instructional session which occurred a week before the vocabulary test. The second stage was the instructional session. In week three, there was no instruction for the participants. In week 4, the post instructional sessions occurred.

Pre-instructional Session (1st week)

One week before word instruction, 120 EFL students were given a demographic information form to take part in the study. The form was given to them to show that the students agreed to participate voluntarily in this study. It took 4-6 minutes to complete the form. The students had previously been told that the study would last for 7 weeks.

Instructional Session (2nd week)

A list of 56 words was written and given to the students. The students were asked to write the meaning of the vocabularies in their Native language (Persian) or Target Language (English). The timing for vocabulary test completion was about 20 minutes. After the vocabulary test, and according to the test results, 22 target gloss words and 34 distractors were selected out of 56 words. According to the test results, 80 students were selected out of 120 participants. The method of selection was such that those who did not answer the target words or gave only 25% of the correct answer were selected.

Then, the students were divided into 3 experimental groups of A (L1 Gloss group), B (L2 Gloss group), C (Pictorial Gloss group). Group D was the control group that received the text without glosses.

Table 5. *Number and Level of Students*

Conditions	N	Level of Proficiency
L1 gloss	20	Intermediate
L2 gloss	20	Intermediate
Pictorial gloss	20	Intermediate
No gloss	20	Intermediate
Total	80	

The participants in each group were 20 EFL learners (Table 5). The proficiency level of the participants was intermediate according to the placement test which was previously given to the students. With the exception of Group D, which received no gloss, the rest of the participants in experimental groups (A, B, & C) received the glossed vocabularies via L1 definition, L2 definition, and pictorial glossing.

Pretest session (3rd week)

The data were collected during the Corona Virus Pandemic, as a result, the participants completed the given test via computers or cellphones. The data collection process lasted 40 minutes. During the instruction, the students looked at the reading text shown on a computer or cellphone screen. All the participants received the text without any type of gloss to check the changes from pretest to posttest. After reading the test, they were given 30 questions to answer, 15 MC questions, and 15 PR questions.

Immediate posttest session (4th week)

In the immediate posttest, the same text that was given to the participants the week before was given; this time with different types of glosses. The students looked at the reading text shown on a computer or cellphone screen. The glossed words were boldfaced. The students in experimental groups received the glossed vocabularies via first language definition, second language definitions, & pictorial glossing). The participants in the L1 gloss group received the same text with first language definition. The participants in the L2 gloss group received the same text with second language definition, and the participants in the pictorial gloss group received the glossed vocabularies with pictures. After the instruction, the students in four groups were given immediate posttest (See Appendices H & I). The purpose was to measure students' word retention.

The researcher asked the students to have a meeting two weeks later. There was not any instruction or activity in the fifth week. The reason for this interval was to measure the participants' vocabulary recall and retention after 2 weeks.

Post instructional Session (6th week)

After two weeks (week 6), the participants were given two delayed posttests. The aim of the delayed test was to measure students' word retention for a long time. The questionnaire was distributed after the delayed test, the same day, to the students in three experimental groups that took 20 minutes to complete. The questionnaire included 9 questions (See Appendix L).

Post instructional Session (7th week)

One week later, a face-to-face interview with experimental groups' participants was held through video calls. The participants were asked to comment on how gloss types affected their vocabulary learning and word retention, and whether they were satisfied with this technique or not. In the end, the results were discussed.

Procedures of Data Analysis

Procedures of data analysis from the mixed method perspective included the use of descriptive statistics including standard deviations and mean scores for each scale and subscales which appear through analysis of the principal component. Using SPSS 26 Software, One-way ANOVA, Kolmogorov-Smirnov test, and Post-hoc comparison were done to analyze the quantitative data. From the qualitative point of view, the study examined the attitudes of second language learners towards glossing strategy for vocabulary teaching with a face-to-face interview and a questionnaire. It is a content analysis.

The Independent Variable in this study included different glossing modes. The gloss modes were first language definition, second language definition, and pictorial gloss.

Immediate and delayed posttest scores of the test were considered as the Dependent Variable in the Kolmogorov-Smirnow test and ANOVA.

Procedures of Quantitative Data Analysis

The quantitative information obtained in this study for review and monitoring was first given to Microsoft Excel ver. 2019, and then the data were entered into SPSS ver.26 software to analyze and test the study hypotheses. Statistical analysis of the study was performed in two sections: descriptive statistics and inferential statistics. In the descriptive statistics section, the researcher described the data by presenting the mean values and standard deviation of the values. In the inferential statistics section, the data were analyzed using the Repeated Measure test. In addition, the researcher used the post hoc test for intergroup comparisons. Before performing this test, the researcher examined the normality assumptions (using the Kolmogorov-Smirnov test) and the sphericity defaults (using Mauchly's test). The significance

level was set at the alpha level of $p < .05$ (Fidell & Tabachnick, 2013). Statistical data were shown through tables.

In the research period immediate and delayed posttest data were collected. The numbers of test items were the same for the immediate and the delayed posttest. The researcher in this study has supposed that comparing pretest vocabulary scores to the immediate posttest scores would show the short term vocabulary retention of the students. On the other hand, the comparison of delayed posttests vocabulary scores with the immediate posttest scores would show the degree of retention of target gloss words from short term to long term. Also, by comparing the immediate test vocabulary scores with the delayed posttest scores, the long term vocabulary retention of participants could be observed. In this study, four groups received one immediate posttest and one delayed posttest. The analysis of variance (ANOVA) was conducted for all comparisons in the study to investigate the effect of gloss types on EFL students' word learning considering short and long term vocabulary retention. Kolmogorov-Smirnow test and post hoc comparison have been used to evaluate the effectiveness of gloss on EFL students' word learning in relation to short term and long term vocabulary retention. The statistical analyses were done for the Productive Recall vocabulary test and for the Multiple-Choice vocabulary test.

Procedures of Qualitative Data Analysis

From the qualitative point of view, the present study examined the perceptions and attitudes of EFL students towards gloss types through face-to-face semi-structured interviews and a questionnaire. All of the participants in the experimental groups (60 language learners) participated in the session of week 6 of the study in which the questionnaire was administered. Because the questionnaire was administered like the other stages of the test via the Internet and virtually, all 60 members of the experimental groups participated in this questionnaire. Then the responses of the survey were analyzed to test whether EFL students' perceptions and attitudes about vocabulary retention and learning were influenced by different types of gloss.

Regarding the interviews that took place in the 7th week, because it was voluntary and the researcher did not insist on the presence of all students, only 9 participants volunteered for the interview. In this study, the voices of the interviewees were recorded by the researcher for further information analysis. All the interviews were transcribed using Word software for documentation. After transcribing the data, they were checked to ensure the accuracy of the statements.

Research Ethics

In this research, the researcher obtained legal permission from the institute to start the research because procedural ethics requires obtaining permission from the institute to conduct research. The researcher explained and clarified the purpose and method of her research to each participant, therefore, they could ask questions whenever they wished. The students signed a written consent form stating that they were aware of their rights and the seven-week investigation period before performing their duties. The researcher informed the participants of the stages of the study. Therefore, all students who participated in the study were assured that their identities would be kept confidential, their participation was voluntary, and that they had the right to leave the study whenever they wished, without any excuse. Collected data and audio recordings were kept secure and confidential.

Conclusion

This study investigated the efficacy of different types of glossing on EFL students' new word learning. The research design, instrumentation, participants, and procedures were discussed in this chapter. Also, data analysis and data collecting procedures were explained, and after that, ANOVA Kolmogorov-Smirnow test, and post hoc comparison were utilized to evaluate the students' comparisons. Data collection was immediate and two weeks after the intervention through tests. EFL students' perceptions and attitudes towards different modes of gloss were evaluated via face-to-face interviews and a questionnaire.

CHAPTER FOUR

Results

Overview

In this chapter, results of quantitative and qualitative data analyses were presented separately in sections and sub-sections titled with related research questions. In the quantitative data analysis section, firstly the results of statistical analyses of student responses were provided, then findings from content analyses were reported. The results of student responses to the questionnaire and the face-to-face interview were provided in the qualitative data analysis section. Finally, the results of qualitative and quantitative data were compared and contrasted to answer the mixed method research questions.

Introduction

The aim of this research was to peruse the effect of various modes of marginal gloss on L2 learners' vocabulary learning. As reviewed in chapter three, quantitative data were calculated on the immediate and delayed test scores. The analyses were performed with comparisons of various gloss types effects. Test comparison took into account the scores of the students in the delayed tests; while, the comparison of sub-test considered the scores of the students in each test. Then a summary of the results is provided at the end of the section.

The information obtained in this study for review and monitoring was first given to Microsoft Excel ver. 2019 and then the data were entered into IBM SPSS ver.26 software to analyze and test the study hypotheses. Statistical analysis of the study was performed in two sections: descriptive statistics and inferential statistics. In the descriptive statistics section, the researcher described the data by presenting the mean values and standard deviation of the values. In the inferential statistics section, we analyzed the data using the Repeated Measure test. In addition, the researcher used the Scheffé post hoc test for intergroup comparisons. Before performing this test, we examined the normality assumptions (using the Kolmogorov-Smirnov test) and the sphericity defaults (using Mauchly's test). Significance level for all tests was considered 0.05.

Here is a review of the repeated measures test assumptions for the first hypothesis of the score obtained in the multiple-choice test.

Quantitative Results

Quantitative Research Questions.

1. **Do different glossing modes (L1 gloss, L2 gloss, or pictorial gloss) have any meaningful impact on language learners' vocabulary learning over time?**

To study the effect of gloss on word learning of language learners, the participants' performances on the pretest were compared with the immediate posttest and delayed posttest.

Because the tests had multiple-choice (MC) and productive recall (PR) options, the researcher made two hypotheses for the first research question.

Hypothesis 1: Is there a difference in the mean score obtained in the multiple-choice test in the groups (L1, L2, Pictorial & Control) over time?

Checking the first default of Repeated Measures ANOVA:

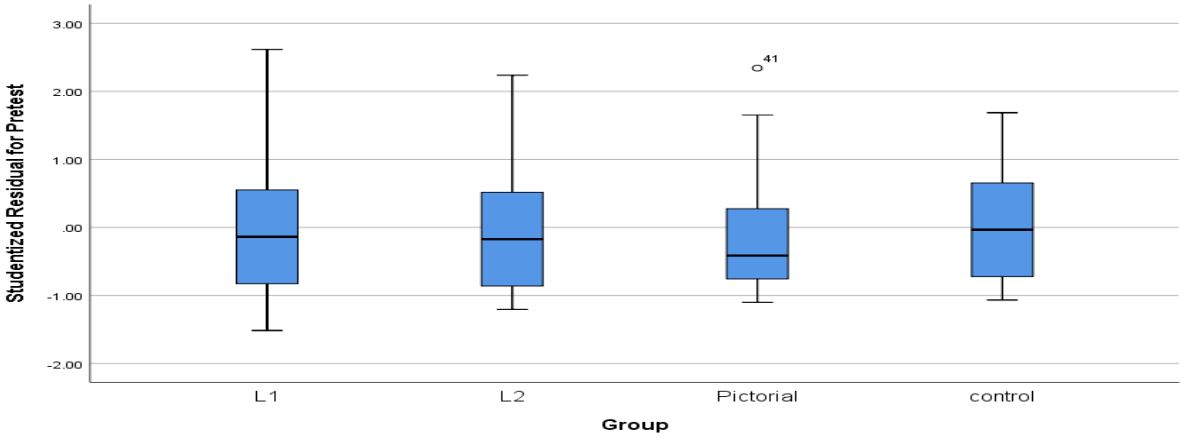
All score values are quantitative, and the first default is available.

Checking the second default of Repeated Measures ANOVA:

Using the box plot diagram, the discarded data were analyzed separately in three measured times for the studentized residual (Figure 1 to 3).

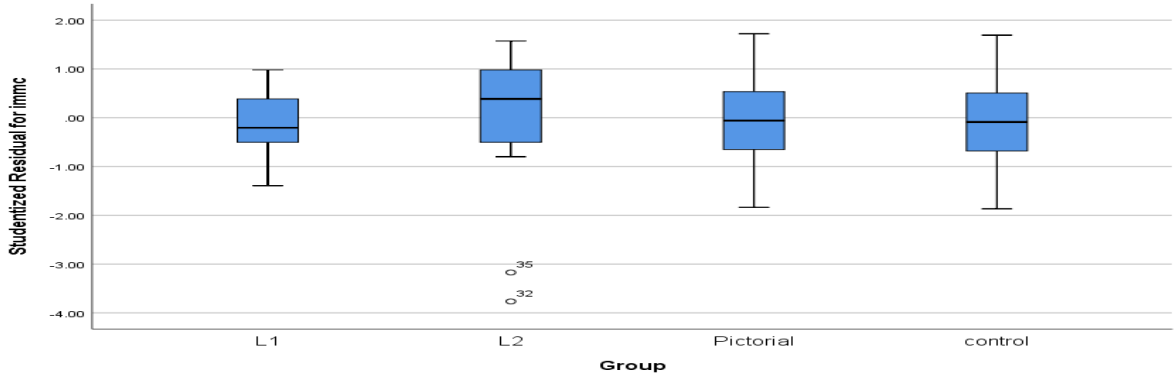
The box plot shows the descriptive values of the standardized residues of the language score in the immediate multiple-choice test in the figure 1. According to the results of this figure, the median values of standardized residues by groups were not significantly different from each other. But the dispersion of group L1 in terms of values was more dispersed compared to other groups. Also, the distribution of standardized residual values of the language score in the immediate test was somewhat symmetric, except in the pictorial group, which was somewhat skewed to the right.

Figure 1. *Box Plot Diagram for Examining Outliers by Group for Multiple-Choice (MC) Immediate Posttest Studentized Resides*



The values of immediate MC (IMMC) studentized residues by study groups have been shown in Figure 1. The median values of the immediate MC studentized residues divided into groups by the multiple-choice test were somewhat equal, except for the L2 group, which had a higher median than the other three groups. In addition, the distribution of immediate MC studentized residues by the study groups was somewhat symmetric, except for the L1 group, which was somewhat skewed to the right. Also, two outliers based on IMMC studentized residues were observed in the L2 group. The two groups of pictorial and control were more scattered in terms of data distribution based on maximum and minimum values than the other two groups.

Figure 2. *Box Plot Diagram for Examining Outliers by Group for Multiple-Choice (MC) Immediate Post- Test Studentized Residues*



The distribution of student residual values for delayed MC (DELMC) have been shown in Figure 2 by the groups studied in the multiple-choice test. According to the results, it can be seen that the median of L1 is somewhat lower than the median of other groups. Scattering in all groups is largely based on the values of the interquartile range, but it can be said that all the groups of their remaining DELMC studentized values were somewhat symmetric. But the distribution of data based on the final values (maximum and minimum) of the studied residues was highly scattered in all groups.

Figure 3. *Box Plot Diagram for Examining Outliers by Group for Multiple-Choice (MC) Delayed Posttest Studentized Residues*

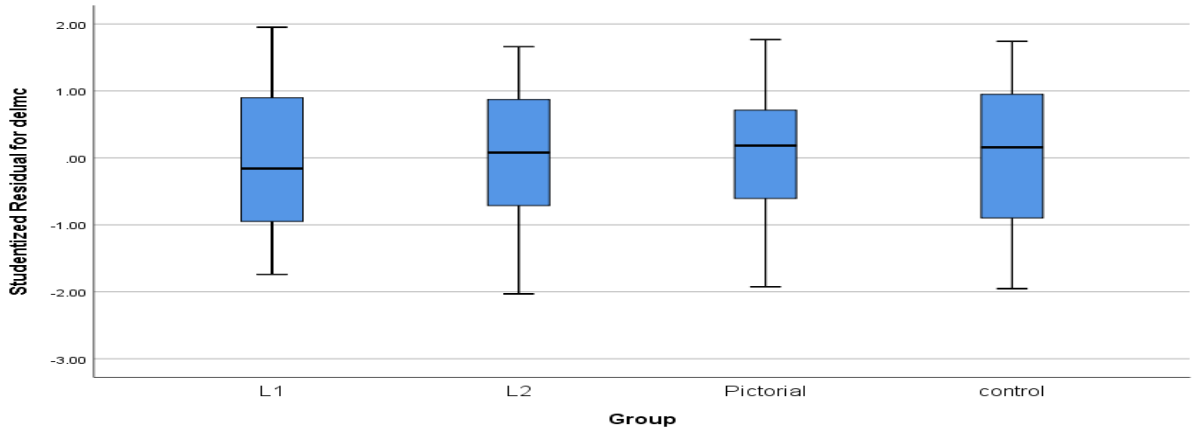


Figure 3 shows box plot diagram for examining outliers by group for multiple-choice (MC) delayed posttest studentized residues. According to Figure 3, it can be seen that there is no significant outlier in the studentized residuals by measurement time.

Checking the Third Default: Normal Distribution of Data

The normality distribution in each combination of dependent groups was investigated using the Kolmogorov-Smirnov test. Only in 5 combinations of dependent groups no normality assumption was established.

Table 6. *Evaluation of the Normality of the Response Variable for the Score Obtained from the Multiple-Choice Test in Each Group*

Measurement time	Group	Mean ± SD	Median	Skewness	Kortosis	Kolmogorov-Smirnov a		
						Statistic [a]	df	p-value
Pretest	L1	3.2 ± 1.64	3	0.68	0.149	0.931	20	0.161
	L2	2.75 ± 1.58	2.5	0.81	-0.083	0.883	20	0.020*
	Pictorial	2.6 ± 1.46	2	0.890	0.18	0.879	20	0.017*
	control	2.55 ± 1.23	2.5	0.246	-0.95	0.905	20	0.052
IMMC	L1	18.35 ± 1.18	18	-0.132	-0.786	0.918	20	0.090
	L2	12.35 ± 2.39	13	-1.46	2.29	0.844	20	0.004*
	Pictorial	16.1±1.51	16	-0.19	-0.31	0.961	20	0.562
	control	5.15±1.59	5	-0.271	-0.554	0.953	20	0.417
DELMC	L1	13.3±2.02	13	0.134	-1.12	0.945	20	0.303
	L2	10.85±2.06	11	-0.259	-0.746	0.942	20	0.256
	Pictorial	11.65±1.63	12	-0.09	0.315	0.964	20	0.626
	control	5.7±2.02	6	-0.134	-1.12	0.945	20	0.303

a: Using Kolmogorov-Smirnov Test
*: Significant at <0.05 level

Table 6 shows evaluation of the normality of the response variable for the score obtained from the multiple-choice test in each group. The L2 group (p = 0.02) and the Pictorial group (p = 0.017) at the time of pretest measurement, the L2 dependent group (p = 0.004) at the time of IMMC measurement, the L2 dependent group (P = 0.003) at the time of IMPR measurement and the L1 dependent group (p = 0.002) at the time of DELPR measurement. Therefore, the approximately normal distribution is established in each combination of dependent groups (Table 6).

Examining the Fourth Default: The Sphere Assumption

The results of Mauchly's spherical test have been given in Table 7.

Table 7. *Mauchly's Test Results for Sphericity*

Within-subjects effect	Mauchly's W	Approx. Chi-Square	df	p-value
Score obtained in a multiple-choice test	.94	4.8	2	.090

a: Using Mauchly's W Test Value

According to the results of Mauchly's sphericity test (Table 7), it can be seen that the sphericity assumption is valid, and we must use the output results of the within-subjects effects tests (p = 0.09).

The presuppositions of the repeated measurement test for hypothesis 1 of the study were examined, and all of them were available. Now one can see the results of the repeated size test for hypothesis 1 (difference in the score obtained in the multiple-choice test between groups).

1. Intragroup effect tests (difference between measurement times) in a multiple-choice test

Table 8. *Descriptive Values of the Score Obtained in the Multiple-Choice Test by Groups and Measurement Time*

Measurement time	Group	Mean	SD
Pretest	L1	3.2	1.64
	L2	2.75	1.59
	Pictorial	2.6	1.47
	Control	2.55	1.23
	Total	2.78	1.48
Immediate posttest	L1	18.35	1.18
	L2	12.35	2.39
	Pictorial	16.1	1.52
	Control	5.15	1.59
	Total	12.9	5.32
Delayed posttest	L1	13.3	2.03
	L2	10.85	2.059
	Pictorial	11.65	1.63
	Control	5.7	2.03
	Total	10.38	3.44

To examine the difference in the mean score obtained in the multiple-choice test, the researcher used the repeated measures test. Using this repeated measures test, the researcher examined the difference in the score obtained in the multiple-choice test. Descriptive values of the score obtained in the multiple-choice test in three groups and the results of this test have been shown in Table 8.

The marginal mean values related to the measurement time are presented in Table 9.

Table 9. *Estimated Marginal Mean for Measurement Time*

Trial	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Pretest	2.775	.167	2.443	3.107
Immediate posttest	12.988	.193	12.602	13.373
Delayed posttest	10.375	.217	9.942	10.808

Table 9 shows estimated marginal mean for measurement time in pretest (M = 2.77), immediate posttest (M = 12.98), and delayed posttest (M = 10.37).

The values related to the marginal mean of the studied groups are presented in Table 10.

Table 10. *Marginal Mean Values by Study Groups*

Group	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
L1	11.6	.21	11.2	12.0
L2	8.7	.21	8.2	9.1
Pictorial	10.1	.21	9.7	10.5
Control	4.5	.21	4.1	4.9

The values related to the marginal mean of the studied groups are presented in Table 10. The Mean value for L1 gloss group is 11.6, for L2 gloss group 8.7, for pictorial gloss group 10.1, and for control group 4.5.

According to the results of estimated marginal means for the measurement time (Table 9), it can be concluded that the ascending order of the mean score obtained in the multiple-choice test is for Pretest (Mean=2/7), Immediate posttest (Mean=10/37), and Delayed Posttest (Mean=12/98).

In addition, the interaction (multiple-choice test scores obtained in groups) of all multivariate tests (Sphericity Assumed, Greenhouse-Geisser, Huynh-Feldt, Lower-Bount) is significant ($p < 0.001$). This indicates that the score obtained in the multiple-choice test during the three stages of measurement depends on the type of group in which participants took place (ie L1, L2, Pictorial, & Control). The graph presented in Figure 4 can be used to guide the interpretation of the interaction. This graph is obtained from the values of the estimated marginal means of the score obtained in the multiple-choice test by measurement time and the study group. This graph shows the mean score obtained during the three measurement stages

by the study group. The scoring trend in all three groups is increasing, but this increase was greater for the L1 and pictorial groups compared to the other two groups.

Table 11. *Results of Within-Subject Effects*

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Score obtained in multiple-choice test	Sphericity Assumed	4503.5	2	2251.7	701.3	<0.001
	Greenhouse-Geisser	4503.5	1.9	2391.6	701.3	<0.001
	Huynh-Feldt	4503.5	2.0	2251.7	701.3	<0.001
	Lower-bound	4503.5	1.0	4503.5	701.3	<0.001
Score obtained in group multiple-choice test	Sphericity Assumed	949.8	6	158.3	49.3	<0.001
	Greenhouse-Geisser	949.8	5.6	168.1	49.3	<0.001
	Huynh-Feldt	949.8	6.0	158.3	49.3	<0.001
	Lower-bound	949.8	3.0	316.6	49.3	<0.001

a: Using Fisher test for within subject effects * : Significant at <0.05 level

The results of the Repeated Measure Multivariate Test are presented in Table 11 This test is an intergroup effect test. The main effects of the score obtained in the multiple-choice test based on all multivariate tests (Sphericity Assumed, Greenhouse-Geisser, Feldt, Lower-Bount,) are significant (p> 0.001), which means that the scores obtained in the multiple-choice test in the three stages of measurement (pretest, immediate posttest, and delayed posttest) have statistically significant differences from each other (Table 11). Within-Subjects Contrasts tests provide comparisons between the scores obtained in a multiple-choice test during three measurements. The first comparison of Level 1 vs. Level 2 is related to the test for measuring the scores obtained in the multiple-choice test before the start of the study (M = 2.75) and immediately after the start of the study (12.98), which is statistically significant (p <0.001). Second Comparison Level 2 vs. Level 3 is related to the test for measuring scores obtained immediately after the start of the study (M = 12.98) and with a delay, after the start of the study (M = 10.37). The mean value of this comparison is statistically significant (p <0.001).

Figure 4. *Graph of Marginal Means Estimated by Group and Measurement Time in Scores Obtained in Multiple-Choice Test*

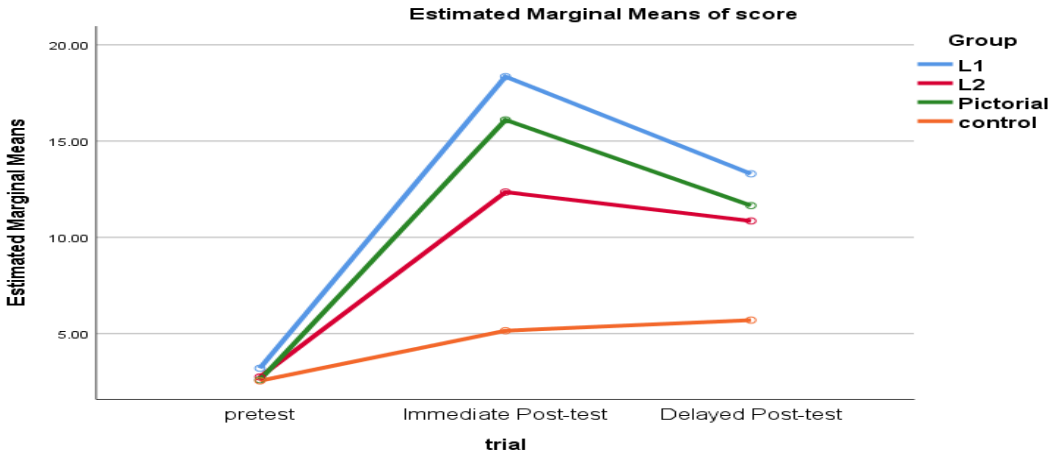


Figure 4 represents graph of marginal means estimated by group and measurement time in scores obtained in multiple-choice test. According to Figure 4, the results of Table 12 are evident.

Table 12. *Results of Intra-Group Comparison Tests at Different Times Based on the Main and Interactional Effects*

Source	factor1	Type III Sum of Squares	df	Mean Square	F	p-value
Score obtained in multiple-choice test	Level 1 vs. Level 2	8343.6	1	8343.6	1655.0	<0.001
	Level 2 vs. Level 3	546.0	1	546.0	69.9	<0.001
Score obtained in group multiple-choice test	Level 1 vs. Level 2	1870.2	3	623.4	123.7	<0.001
	Level 2 vs. Level 3	411.1	3	137.0	17.5	<0.001

a: Using Fisher test for between-subject effects *: Significant at <0.05 level

Comparing the results of the interaction test (score obtained in the group multiple-choice test) between Level 1 vs. Level 2 is a significant measurement (p <0.001), which means the measurement time of Level1 vs. Level 2 differs between the four groups. In addition, a comparison of the interaction test (score obtained in the group multiple-choice test) between Level 2 vs. Level 3 is a significant measurement (p <0.001), which means the measurement time of Level 2 vs. Level 3 differs between the four groups (Table 12).

1. Intergroup Effect Tests in MC

Table 13. *Intergroup Effect Tests*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	6072.6	1	6072.6	7077.9	<0.001
Group	568.7	3	189.6	220.9	<0.001
Error	65.2	76	.9		

Intergroup effect tests are equivalent to one-way analysis of variance. The results of the intergroup effects test show that the score obtained in the multiple-choice test is statistically and significantly different between the studied groups (p <0.001) (Table 13). The results show that the group variable is statistically significant. According to the table of marginal means of the group (Table 9), it can be seen that the highest mean score obtained from the multiple-choice test belongs to the L1group (Mean = 11.6), Pictorial group (Mean = 10.1), L2 group (Mean = 8.7) and control group (Mean = 4.5).

Table 14. *Scheffe Post Hoc Test Results to Examine the Difference in Scores Obtained in the Multiple-Choice Test*

First group	Second group	The mean difference of the first and the second groups	Std. Error	P-value	95% Confidence Interval	
					Lower Bound	Upper Bound
L1	L2	2.9*	.3	<0.001	2.1	3.8
	Pictorial	1.5*	.3	<0.001	.6	2.3
	Control	7.2*	.3	<0.001	6.3	7.9
L2	L1	-2.9*	.3	<0.001	-3.8	-2.1
	Pictorial	-1.5*	.3	<0.001	-2.3	-.6
	Control	4.2*	.3	<0.001	3.3	5.0
Pictorial	L1	-1.5*	.3	<0.001	-2.3	-.6
	L2	1.5*	.3	<0.001	.6	2.3
	Control	5.7*	.3	<0.001	4.8	6.4
Control	L1	-7.2*	.3	<0.001	-7.9	-6.3
	L2	-4.2*	.3	<0.001	-5.0	-3.3
	Pictorial	-5.7*	.3	<0.001	-6.4	-4.8

a: Using Scheffé test of Post-hoc test
* : Significant at <0.05 level

Scheffe Post Hoc Test showed that the mean scores obtained in the multiple-choice test in comparisons between two groups were significantly different from each other (p <0.001) (Table 14).

However, between the experimental groups, the students who took part in the L1 gloss group indicated more erosion of the new vocabularies in the delayed test. While the L2 gloss group showed less erosion of the learned vocabularies.

The results significantly showed the existing difference between all groups' scores of immediate posttest. It means that in the experimental groups, the glossing strategy has more impact on readers' short term word retention than the non-glossing strategy. Furthermore, no meaningful difference existed between the mean scores of first language gloss, second language

gloss, and pictorial gloss groups. It means that the experimental groups performed similarly on their immediate Post Test.

Hypothesis 2: The mean score obtained in the productive recall test (PR) is different in L1, L2, pictorial, and control groups over time?

Checking the first default of Repeated Measures ANOVA:

All score values are quantitative and the first default is available.

Checking the second default of the Repeated Measures ANOVA:

Outliers were analyzed separately by groups for the studentized residuals using the box plot diagram (Figures 5 - 7).

The distribution of the remaining student values for the pretest is shown by the groups studied in the descriptive test. According to the results, it can be seen that the pictorial median is somewhat lower and that the control median is somewhat higher than the median of the two groups L1 and L2. Dispersion in all groups is high based on mid-quadratic amplitude values and has a symmetrical distribution except for the pictorial group, which has less dispersion and is somewhat skewed to the left. The distribution of data based on the final values (maximum and minimum) of the studied residues was highly dispersed in all groups and was highest in L1 group. In the pictorial group, a skewed data was observed.

Figure 5. *Box Plot Diagram to Analyze Outliers by Groups for the Pretest Studentized Residuals of PR*

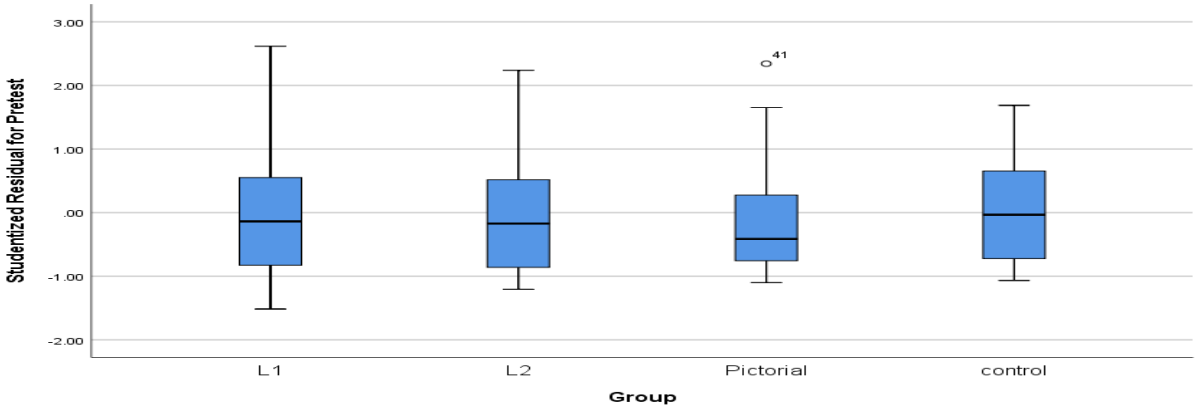


Figure 5 shows box plot diagram to analyze outliers by groups for the pretest studentized residuals of Productive Recall.

One can see the distribution of the residual values obtained for the IMPR test in the following groups in the descriptive test. According to the results, it can be seen that the pictorial median is somewhat higher than the median of the other three groups. Scattering in all groups was very low based on the values of the interquartile range, and the distributions of groups L1

and L2 were somewhat skewed to the right. Data distribution based on final values (maximum and minimum) of student residues was low in all groups except the pictorial group. Three outliers were observed in the L2gloss group.

Figure 6. *Box Plot Diagram to Analyze Outliers by Groups for the Immediate Posttest Studentized Residuals of PR*

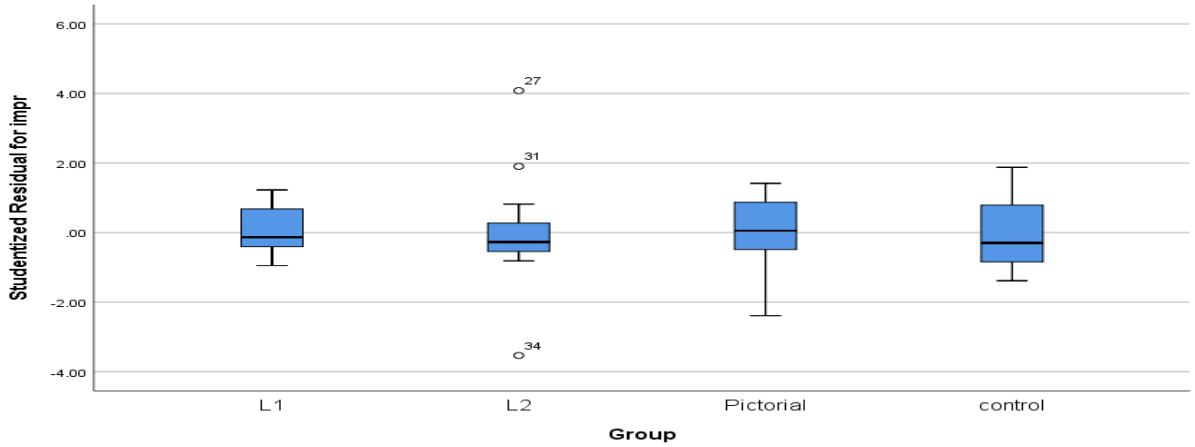


Figure 6 shows box plot diagram to analyze outliers by groups for the immediate posttest studentized residuals of Productive Recall.

The distribution of the residual values studied for DELPR can be seen by the groups studied in the descriptive test. According to the results, it can be seen that the medians of these groups were somewhat equal to each other. The distribution in all groups was very low based on the values of the interquartile range, and the distribution of all groups except the L1, which was somewhat skewed to the right, was symmetrical in the other groups. The distribution of data based on the final values (maximum and minimum) of the studied residues except for the outgoing data was somewhat high in all groups. A skewed data was observed in the L1 group and the L2 group.

Figure 7. *Box Plot Diagram to Analyze Outliers by Groups for the Delayed Posttest Studentized Residuals of PR.*

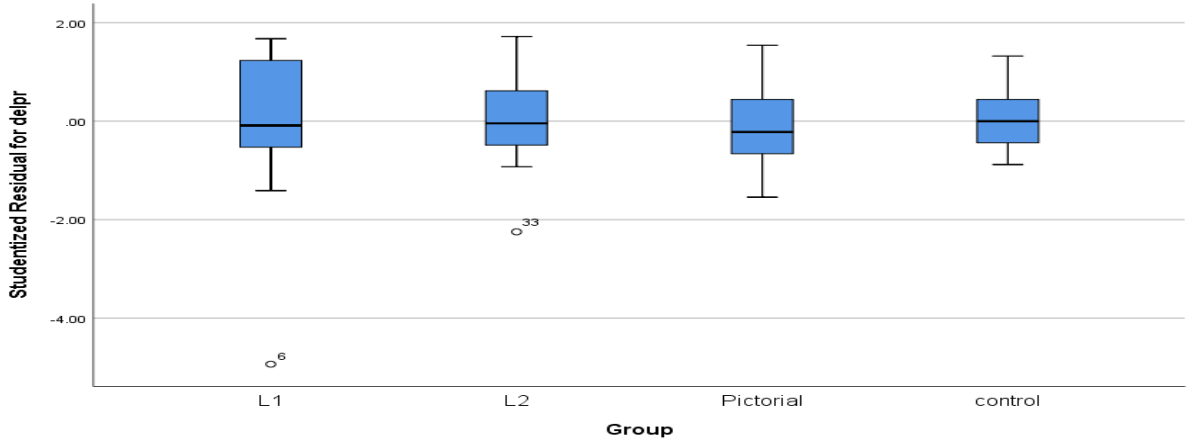


Figure 7 shows box plot diagram to analyze outliers by groups for the delayed posttest studentized residuals of Productive Recall.

According to the Figures (5-7), it can be seen that there is no significant outlier in the studentized residuals by groups, and the default of non-existing studentized residuals outliers is available.

Checking the Third Default, Checking the Normal Distribution of Data

The normality distribution in each combination of dependent groups was investigated in the descriptive test using the Kolmogorov-Smirnov test.

Table 15. *Investigation of the Normality of the Response Variable for the Score Obtained from the PR Test by Groups*

Measurement time	Group	Mean ± SD	Median	Skewness	Kortosis	Kolmogorov-Smirnov		
						Statistic	df	p-value
Pretest	L1	3.2 ± 1.64	3	0.68	0.149	0.931	20	0.161
	L2	2.75 ± 1.58	2.5	0.81	-0.083	0.883	20	0.020*
	Pictorial	2.6 ± 1.46	2	0.890	0.18	0.879	20	0.017*
	Control	2.55 ± 1.23	2.5	0.246	-0.95	0.905	20	0.052
IMPR	L1	17.75±1.25	17.5	0.347	-0.84	0.908	20	0.059
	L2	11.5 ± 2.58	11	0.62	4.76	0.831	20	0.003*
	Pictorial	15.4±1.66	15.5	-.866	1.12	0.927	20	0.133
	Control	4.55±1.79	4	0.215	-0.89	0.942	20	0.256
DELPR	L1	12.2±3.38	12	-1.89	5.62	0.823	20	0.002*
	L2	11.1±2.1	11	-0.26	0.69	0.957	20	0.491
	Pictorial	11.5±1.79	11	0.49	0.142	0.926	20	0.129
	Control	5±1.6	5	0.49	-0.76	0.912	20	0.069

a: Using Kolmogorov-Smirnova Test
*: Significant at <0.05 level

The normality assumption was not established only in 3 combinations of dependent groups. The L2 (p = 0.02) and Pictorial (p = 0.017) at the time of pretest measurement, dependent group L2 (p = 0.003) at the time of IMPR measurement, and dependent group L1 (P = 0.002) at the time of DELPR measurement. It is partly negligible due to the robust nature of the tests used to establish the normality assumption. Therefore, the approximately normal distribution is available in each combination of dependent groups (Table 15).

Checking the fourth default: the spherical assumption

The results of Mauchly's spherical test are shown in Table 16.

Table 16. *Mauchly's Spherical Test Results*

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	p-value
Score obtained in a multiple-choice test	.94	4.8	2	.090

According to the results of Mauchly's spherical test (Table 16), it can be seen that the sphericity assumption is available, and we must use the output results of within-subjects effects tests (p = 0.09).

While the assumptions of repeated measures test for the second hypothesis were analyzed; all the assumptions were available. The results of the repeated size test for hypothesis 2 are available (difference in the obtained score in the PR test between the groups).

1- Intergroup effects tests (difference between measurement times) in PR test

To examine the difference in the mean score obtained in the PR test, the researcher used the repeated measures test. Using this test, the researcher examined the difference in the score obtained in the PR test.

Table 17. *Descriptive Values of the Scores Obtained in the PR Test by Groups*

Measurement time	Group	Mean	SD
Pretest	L1	3.2	1.64
	L2	2.8	1.59
	Pictorial	2.6	1.47
	Control	2.6	1.23
	Total	2.8	1.48
Immediate posttest	L1	17.8	1.25
	L2	11.5	2.59
	Pictorial	15.4	1.67
	Control	4.6	1.79
	Total	12.3	5.36
Delayed posttest	L1	12.2	3.38
	L2	11.1	2.10
	Pictorial	11.5	1.79
	Control	5.0	1.62
	Total	9.9	3.69

Table 17 shows the descriptive values of the scores obtained in the PR test by different groups. One can see the descriptive values of the score obtained in the descriptive test in three groups (Table 17) and the results of this test.

Table 18. *Estimated Marginal Mean for Measurement Time*

Trial	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Pretest	2.7	.16	2.44	3.11
Immediate posttest	12.3	.21	11.88	12.72
Delayed posttest	9.9	.26	9.43	10.46

The marginal mean values related to the measurement time are shown in Table 18. The mean value for pretest is 2.7, for immediate posttest 12.3, and for delayed posttest 9.9.

Table 19. *Marginal Mean Values for Each Group*

Group	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
L1	11.05	.24	10.58	11.53
L2	8.45	.24	7.98	8.93
Pictorial	9.83	.24	9.36	10.31
Control	4.03	.24	3.56	4.51

The results of the Repeated Measure test have been shown in Table 19. This test is an intergroup effect test. The main effects of the score obtained in the descriptive test based on all multivariate tests (Sphericity Assumed, Greenhouse-Geisser, Huynh-Feldt, Lower-Bount) are significant ($p < 0.001$). This means that the scores obtained in the PR test in three measurement stages (Pretest, Immediate Posttest, Delayed Posttest) are significantly different from each other. According to the results of the table of estimated marginal means for the measurement time (Table 13), it can be concluded that the ascending order of the score obtained in the PR test for the mean score are respectively (Mean = 2.7) for pretest, (Mean = 9.9) for Delayed Posttest, and (Mean = 12.3) for Immediate posttest.

In addition, the interaction (score obtained in the descriptive test * group) of all multivariate tests (Sphericity Assumed, Greenhouse-Geisser, Huynh-Feldt, Lower-Bount) is significant ($p < 0.001$). This indicates that the score obtained in the PR test during the three stages of measurement depends on the type of group (L1, L2, Pictorial, and Control).

Table 20. *Results of Within Subject Effects*

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Score obtained in the PR test	Sphericity Assumed	3939.4	2	1969.7	505.8	<0.001
	Greenhouse-Geisser	3939.4	1.8	2092.4	505.8	<0.001
	Huynh-Feldt	3939.4	2.0	1969.7	505.8	<0.001
	Lower-bound	3939.4	1.0	3939.4	505.8	<0.001
Score obtained in the group PR test	Sphericity Assumed	983.3	6	163.8	42.1	<0.001
	Greenhouse-Geisser	983.3	5.6	174.1	42.1	<0.001
	Huynh-Feldt	983.3	6.0	163.9	42.1	<0.001
	Lower-bound	983.3	3.0	327.8	42.1	<0.001

a: Using Fisher test for within subject effects *: significant at <0.05 level

Table 20shows the results of within subject effects. Within-Subjects Contrasts Tests provide comparisons between the scores obtained in the PR test during three measurements. The first comparison of level 1 vs. level 2 is related to the test for measuring the scores obtained in the descriptive test before the start of the study (M = 2.75) and immediately after the start of the study (M = 12.3), which is statistically significant (p <0.001). The second comparison of Level 2 vs. Level 3 is related to the test for measuring descriptive scores immediately after the start of the study (M = 12.3) and with a delay after the start of the study (M = 9.9). The mean value of this comparison is statistically significant (p <0.001). Comparison results of interaction test (score obtained in descriptive test * group) between Level1 vs. Level2 is significant (p <0.001). This means the measurement time of Level 1 vs. Level 2 differs between the four groups. In addition, the comparison of the interaction test (score obtained in the descriptive test * group) between Level 2 vs. Level 3 is significant (p <0.001), which means the measurement time of Level 2 vs. Level 3 differs between the four groups. According to Figure 8, these results are visible.

Figure 8. *Figure of Marginal Mean Values Estimated by Group and Measurement Time in PR Test*

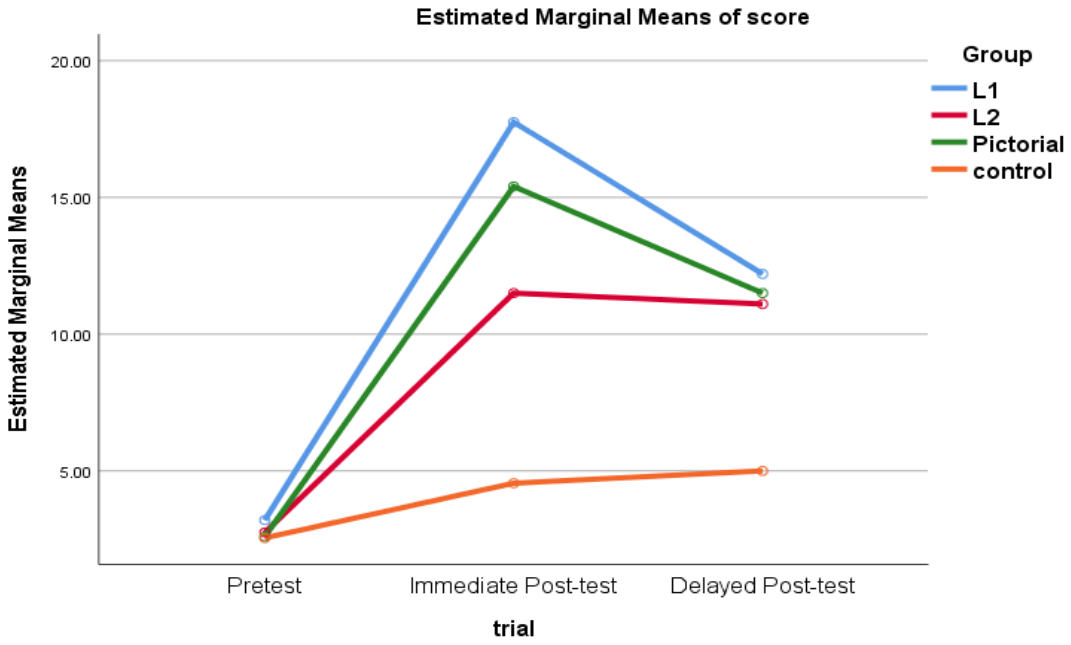


Figure 8 can be used to guide the interpretation of the interaction. This graph is obtained from the values of the estimated marginal means of the score obtained in the descriptive test by measurement time and the study groups. This graph shows the mean score obtained during the three measurement stages by the study groups. The scoring order in all three groups is ascending, but this increase is greater for the L1 and pictorial groups compared to the other two groups.

Table 21. *Results of Intra-Group Comparisons at Different Times Based on Main and Interaction Effects*

Source	factor1	Type III Sum of Squares	df	Mean Square	F	p-value
Score obtained in the PR test	Level 1 vs. Level 2	7258.0	1	7258.0	1231.5	<0.001
	Level 2 vs. Level 3	441.8	1	441.8	48.4	<0.001
Score obtained in the group PR test	Level 1 vs. Level 2	1864.0	3	621.3	105.4	<0.001
	Level 2 vs. Level 3	485.7	3	161.9	17.7	<0.001

a: Using Fisher test for between-subject effects
*: Significant at <0.05 level

Table 21 shows results of intra-group comparisons at different times based on main and interaction effects.

2. Intergroup effect tests

Table 22. *Intergroup Effect Tests*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	5566.672	1	5566.672	4894.721	<0.001
Group	562.672	3	187.557	164.917	<0.001
Error	86.433	76	1.137		

a: Using Fisher test for between group effects
*: Significant at <0.05 level

Table 22 shows intergroup effect tests. Intergroup effect tests are equivalent to one-way analysis of variance. The results of the intergroup effects test show that the score obtained in the descriptive test is significantly different between the studied groups (p <0.001) (Table 22).

Table 23. *Scheffe Multiple Post Hoc Test Results to Examine the Difference in Score Obtained in the PR Test*

First group	Second group	The difference between the mean of the first and the second groups	Std. Error	P-value	95% Confidence Interval	
					Lower Bound	Upper Bound
L1	L2	2.6	.3	<0.001	1.6	3.5
	Pictorial	1.2	.3	0.007	.2	2.1
	Control	7.0	.3	<0.001	6.0	7.9
L2	L1	-2.6	.3	<0.001	-3.5	-1.6
	Pictorial	-1.3	.3	0.002	-2.3	-.4
	Control	4.4	.3	<0.001	3.4	5.3
Pictorial	L1	-1.2	.3	0.007	-2.1	-.2
	L2	1.3	.3	0.002	.4	2.3
	Control	5.8	.3	<0.001	4.8	6.7
Control	L1	-7.0	.3	<0.001	-7.9	-6.0
	L2	-4.	.3	<0.001	-5.3	-3.4
	Pictorial	-5.8	.3	<0.001	-6.7	-4.8

a: Using Scheffé test of post-hoc test
*: Significant at <0.05 level

Scheffe multiple post hoc test shows that the mean scores obtained in the PR test between the two groups is significantly different (p <0.001) (Table 23). The results show that the group variable is statistically significant. According to the table the difference between the mean of the first and the second groups of marginal means of the group was significant, it can be seen that the highest mean score difference is between first language gloss group and control group.

2. Which group of students who use glossing (L1, L2, pictorial) get better results in vocabulary learning tests?

To answer the second and third research questions of the study, the descriptive statistics of all participants (control group & experimental groups), from the pretest to the delayed posttest, were analyzed in the previous part. Compared to groups A (L1 gloss) with mean score of 17.8, C (pictorial gloss) with mean score of 15.4, and B (L2 gloss) with mean score of 11.5, the control group (D) obtained the lowest mean score (4.6) in the posttest. Group A (L1 gloss), group B (L2 gloss), and group C (pictorial gloss) performed better than the control group in immediate posttests. The next part provides the findings of changes of all groups in the sessions and examines whether the mean difference between groups from pretests to posttests was statistically significant. The comparison between participants examines which gloss type was significantly effective for vocabulary learning of language learners.

The results indicated that the performance of the first language (L1) gloss group, second language (L2) gloss group, pictorial gloss group, and control group, on the immediate posttest, was significantly different. L1 gloss group (group A) and pictorial gloss group (group C) performed better than the L2 gloss group (group B) in the test comparison and got higher mean differences. Indeed, the L2 gloss group (M = 11.5) was almost better than the control group (M = 4.6). L2 gloss group (group B) received the glossed words through the target language definitions.

When comparing the immediate posttest and delayed posttest scores, it is observed that second language gloss group (M = 11.1) participants' performances were not significantly different from the L1 gloss group (M = 12.2), and pictorial gloss group (M = 11.5). The performance of group D (M = 5.0) significantly differed from that of the experimental groups (A, B, & C). In other words, on delayed posttest language learners' performances in the L2 gloss group (group B) were better than the learners' performances in group D. The students in the L1 gloss group (group A) received the glossed words through definitions in their mother tongue. Therefore, this type of glossing mode (L1 gloss) helped learners to better remember words comparing to L2 definition glossing and pictorial glossing modes. The outcomes revealed that no meaningful difference existed between the experimental groups of the study.

Qualitative Results

Questionnaire and Face to Face Interview

This part of the research is to answer the last research question.

What are EFL learners' attitudes and perceptions towards different types of marginal glossing? Which glossing type do the participants prefer?

Questionnaire

From the experimental groups (L1 gloss, L2 gloss, & pictorial gloss), sixty students filled out the questionnaire. The students were given a questionnaire with nine questions. The questions were based on the 5 points Likert-type scale. In this type of scale, number 1 is considered as complete agreement, and number 5 is considered as complete disagreement with the subject.

Participants were asked four questions about whether they considered the L1 gloss mode to be an effective and simple way to memorize new vocabulary. The other questions reflected students' understanding toward glossing mode with second language (L2) definition. Tables 24 and 25 show the frequency of answers to questions 1-9.

In questions 1-3, the participants were asked to express their views on learning new words with L1 gloss, L2 gloss, or pictorial gloss, respectively.

Table 24. *Response Frequency to Question 1 to 6*

	Frequency (Q.1: L1 gloss)	Frequency (Q.2: L2 gloss)	Frequency (Q.3: pictorial gloss)
Strongly agree (1)	39 (65 %)	8 (13%)	12 (20%)
Agree (2)	18 (30%)	19 (31.6%)	29 (48.3%)
Neither/nor (3)	2 (3.33 %)	20 (33.3%)	13 (21.6%)
Disagree (4)	1 (1.6%)	9 (15%)	5 (8.3%)
Strongly disagree (5)	0(0%)	4 (6.6%)	1(1.6%)

As can be seen in Table 24, 95% of students strongly agree or agree that gloss has made learning easier for them through their native language (L1) definition. None of the participants objected to the efficiency of using the mother tongue gloss mode to make learning vocabulary easier. Approximately 65% of the students (39 students) strongly agree that learning new words by defining their mother tongue was easy for them.

A look at the statistics in question 2 in Table 24 confirms that learners tend to choose 2 (agree) or 3 (neither/nor) on the Likert scale. Approximately 31% of the students (19 out of 60) said they agreed with the second question that was about if L2 glossing mode was the easy way to learn new vocabularies. Examining the general answers, it can be concluded that the answers to these questions were almost neither agreed nor disagreed. In addition, a small number of the students strongly agree with the use of the target language, and approximately 33 % (20 out of

60) agree that new vocabulary learning could be helpful if it is accompanied by the definition of words in L2. Nearly 6.6% of the students (4 out of 60) strongly disagree that it was difficult for them to get the meaning of target vocabularies through L2 gloss.

According to the table, approximately 20% of participants strongly agree that the pictorial glossing mode made it easier for them to learn the target glossy words. 48% of participants agree that they could learn new vocabularies through pictorial glossing mode. Nearly 10% of the participants disagree and strongly disagree that it was difficult to get the meaning of new vocabularies through pictures.

When examining the three types of gloss, in terms of new word learning for students, the L1 gloss comes first, the pictorial gloss is in the second level, and the L2 gloss is the last one.

Table 25. *Response Frequency to Question 4 to6*

	Frequency (Q.4: L1 gloss)	Frequency (Q.5: L2 gloss)	Frequency (Q.6: pictorial gloss)
Strongly agree (1)	31 (51.66%)	3 (5 %)	9 (15%)
Agree (2)	18 (30%)	12 (20%)	24 (40%)
Neither/nor (3)	6 (10%)	20 (33.33%)	11 (18.33%)
Disagree (4)	3(5 %)	18 (30%)	12 (20%)
Strongly disagree (5)	2(3.33%)	7 (11.66%)	4 (6.66%)

In questions 4 to 6, participants were asked if it was easy to remember a new word when receiving instruction through mother tongue, target language, or pictorial glossing. According to Table 25, it can be seen that about half of the students (51.66 %) strongly agree that using L1 gloss helped them to recall the vocabulary in the final test. For this question, the students chose number 1 (strongly agree). Nearly 81 % of them strongly agree or agree that comparing with other glossing types, the L1 gloss helped the students to recall the new vocabularies in the final tests. Only 10% of the students (6 students) were indifferent (neither agree nor disagree) with this gloss type, and about 8 % of the students (5 out of 60) disagreed or strongly disagreed with the effectiveness of providing L1 gloss for long term word retention.

On the other hand, 15 students (25%) agreed or strongly agreed that target vocabularies would be recalled easily when they used second language gloss, 20 participants (33%) were indifferent with this type of gloss, and only 25 students (41% of participants) disagreed or strongly disagree with the easiness of recalling new vocabularies through second language gloss.

In questions 7 to 9, students were given questions about their desire to use different modes of gloss including first language gloss, second language gloss, and pictorial gloss as the

future language learning strategies while learning a new vocabulary. Findings are represented in Table 26.

Table 26. *Response Frequency to Question 7 to9*

	Frequency of Q.1: (L1 gloss)	Frequency of Q.2: (L2 gloss)	Frequency of Q.3: (pictorial gloss)
Strongly agree (1)	35 (58.33 %)	4 (6.66%)	7 (11.66%)
Agree (2)	16 (26.66%)	11 (18.33%)	23 (38.33%)
Neither/nor (3)	6 (10%)	17 (28.33%)	21 (35%)
Disagree (4)	2 (3.33%)	19 (31.66%)	5 (8.33%)
Strongly disagree (5)	1(1.66%)	9 (15%)	4(6.66%)

	Strongly agree		Agree		Neuter		Disagree		Strongly Disagree	
	F	%	F	%	F	%	F	%	F	%
Question										
Write the questions (L1 Gloss) here	(58.33 %)				4 (6.66%)				7 (11.66%)	
Write the questions (L2 Gloss) here										
Write the questions (Pictorial Gloss) here										
Agree (2)	16 (26.66%)				11 (18.33%)				23 (38.33%)	
Neither/nor (3)	6 (10%)				17 (28.33%)				21 (35%)	
Disagree (4)	2 (3.33%)				19 (31.66%)				5 (8.33%)	
Strongly disagree (5)	1(1.66%)				9 (15%)				4(6.66%)	

According to Table 26, it can be concluded that nearly 86% of the students agree or strongly agree to use the L1 gloss in the future for the new word learning process. Only 10 students (10%) neither agree nor disagree about using L1 gloss for future learning. However, nearly 5% of participants strongly disagree or disagree to use this strategy of word learning in the future.

Nearly 25% of the students agree or strongly agree that they will use L2 gloss for vocabulary learning in the future. However, 28% of the participants neither agree nor disagree to use L2 gloss in the future. Nearly 46% of the participants either strongly disagree or disagree to use L2 definition gloss for vocabulary learning.

Almost 50% of participants strongly agree or agree about using pictorial gloss in the future. Around 35% of the participants neither agree nor disagree to use pictorial gloss in future

tests. 9 participants (15%) strongly disagree or disagree with the use of pictorial glossing as a technique for learning new words.

Overall, the results of the questionnaire investigated that the students chose to learn new vocabularies through the L1 gloss mode as the most desirable way to learn the new words. Pictorial gloss mode was their second preference, and the L2 gloss type was their last choice.

Face to Face Interview with Participants

In the final stage of the research, some of the participants were invited for an interview in order to understand the attitudes of participants and their preferences towards glossing modes (first language gloss, second language gloss & pictorial gloss).

Those students were asked the following questions. a) What strategies do they use to learn new words; B) What strategies do they use to remember words; c) Which vocabulary learning technique (L1 gloss, L2 gloss or pictorial gloss) did they prefer/like, and why; d) What is their opinion about vocabulary learning through gloss; e) Did the L2 gloss mode help them remember the words in the final tests; f) Did the L1 gloss mode help them remember the words in the final test; g) Did the pictorial gloss mode help them remember the words in the final tests; h) How have the vocabulary learning modes practiced here changed the way they used to learn new words. The findings of these interviews are reported.

The interviewees agreed that the L1 gloss mode was a beneficial word learning strategy that helped the students acquire the new vocabularies faster and easier. The first interviewee, Maryam, mentioned that reading a text with first language definition of the new words helped her to do better in the delayed test as she could relate the meaning of new vocabularies to the related words. She enjoyed her learning experience as she was strongly motivated to learn the words: “We keep the meaning of the words in our minds when we learn them by L1 definition. This strategy helped me a lot to remember the words after two weeks.”

Rasa, another student, mentioned that the new word learning with first language definition (L1 gloss) was a very effective, motivating, and enjoyable experience for vocabulary learning and saving the words in his memory: “Using gloss technique is extremely helpful, since it is not possible to check the words one by one from the dictionary when reading the text. Previously, I had difficulty learning vocabulary, reading and understanding the text. The glossing technique with L1 definition will be very useful for me. I enjoyed this learning experience as I was strongly motivated to learn the words, repeat them several times, and use them later.”

Another interviewee, Tina, used L1 glossing as an effective technique for vocabulary learning. This technique enabled her to learn new vocabularies and gave the opportunity to repeat the target vocabularies many times to recall and remember the words in long term: "When I know the meaning of a word, I can learn it better. The gloss technique helped me to remember the definitions fast. The L2 gloss did not help me because I did not know the meaning of the words in the second language." She added: "the meaning of some words can be deduced from the pictorial gloss, but the meaning of some pictures are difficult to get, and this gloss technique cannot be used for all words."

One other interviewee, Hadi, mentioned that reading a text with gloss of the new words extremely helped him: "I used to get anxious while reading texts because I might not understand the meaning of new words. But now, despite the gloss technique, I am very comfortable, and I enjoy reading." He declared: "I believed that I could never be able to read because my vocabulary was limited, and I always had to use a dictionary. When I was using the dictionary, I came across several meanings that I did not know which one to choose for the current word in the text. But with the help of gloss technique, this problem was completely solved for me."

As a result, the participants' comments indicated that EFL learners understood the L1 definition gloss as the effective and beneficial new word learning strategy for vocabulary learning. Furthermore, compared to the L1 glossing, the pictorial gloss strategy had little effect on EFL learners, but it was more impressive than L2 glossing.

Comparison of Results

Comparison of quantitative and qualitative results indicates that using glossing strategy was more effective than using no glossing technique for students' vocabulary learning in the short term. The glossing strategy could not help meaningfully to language learners' vocabulary retention in the long term. Between experimental groups, the students in the L2 gloss group were not successful in the retention of the learned vocabularies in the delayed test while L1 gloss group students were more successful than the other groups in the same test. Therefore, the glossing strategy for word learning was beneficial for language learners' vocabulary learning in the short term.

Results showed that different types of marginal glossing were effective for vocabulary learning of language learners. In addition, L1 gloss (first language definition) and pictorial gloss were more effective than the L2 gloss (target language definition) and control group (without any gloss) for short term retention of learners. Different types of glossing helped language learners to learn vocabulary in the long term. From the pre- to posttest, the students in different

glossing groups got great scores in productive recall tests. Between the immediate test and the delayed test, they had a significant loss.

The aim of the research was to determine whether students can learn target vocabularies from the immediate to the delayed test. The other aim of the review was to show which gloss type was more effective for this vocabulary learning.

The mean score of the control group was the lowest on the delayed test compared with L1, L2, and pictorial gloss groups. The performance of glossed groups A (first language gloss), B (second language gloss), and C (Pictorial gloss) decreased from the immediate test to the delayed test.

Thus, in the long term, the participants of the first language gloss group, second language gloss group, and pictorial gloss group were unable to recall a meaningful number of the glossed vocabularies and showed a meaningful erosion of the vocabularies in the delayed posttest. This means that using different types of glossing did not play a significant role in EFL learners' vocabulary retaining in the long term. However, if we want to compare the experimental groups, in the delayed test, the participants in the L2 gloss group revealed more erosion of the learned vocabularies than the other groups. However, in the same test, students in the pictorial gloss group showed less erosion of the learned vocabularies.

The findings revealed that: first, the glossing strategy for vocabulary learning was beneficial for students' word learning in the short term. Second, using different types of marginal glossing did not help significantly the word retention of language learners in the long run compared to the short time. However, comparing the three glossed groups, it can be seen that the participants in the L1 gloss group showed less erosion of the learned new words in the delayed tests. However, L2 gloss students showed more erosion of the new vocabularies in the testing process. Third, the glossing technique was effective for the word learning of language learners. Fourth, different types of glossing were beneficial for EFL learners' new word learning and retention in the short term. Fifth, from short term to long term, different types of glossing for EFL learners were effective in retaining new words. Sixth, different modes of gloss play a significant role in participants' learning and memorizing words over the long term. First language gloss was beneficial for EFL learners' word recall and retention in the short term and long term. The pictorial glossing was beneficial for language learners' vocabulary recall and retention. The second language gloss influences positively participants' word retention, but not as much as the L1 glossing and pictorial glossing strategies.

Conclusion

The results of this chapter indicated that EFL learners preferred L1 glossing as their most popular vocabulary learning strategy. Therefore, it can be said that the L1 definition glossing aided the students to learn the glossed vocabularies easily. According to the participants, two other types of glossing (pictorial gloss & L2 gloss), respectively, were the second and third strategies for learning words. From the results of the interviews, it can be said that the L1 gloss for vocabulary learning helped EFL learners to remember and recall the target vocabularies more easily and better; therefore, EFL learners will use this gloss type for their word learning in the future.

CHAPTER FIVE

Discussion

Overview

In this chapter, qualitative and quantitative findings presented in the previous section are discussed with reference to previous research about the effect of gloss types on vocabulary retention and learning. Quantitative and qualitative results are discussed independently, under titles that implicitly address each one of the research questions. An overall evaluation of quantitative and qualitative results will be presented in the conclusion chapter.

Introduction

Four groups including three experimental groups and one control group participated in the present study. The students in the experimental groups received reading passages with 22 target vocabularies in various glossing types (L1 gloss, L2 gloss, and pictorial gloss), the control group had no glossing modes. EFL students' perceptions of glossed words knowledge were examined through Vocabulary Level Test, multiple-choice (MC) tests, and vocabulary pretest of productive recall (PR). The lexical tests (immediate and delayed) were used to measure the retention and acquisition of learners' vocabularies in the long term (during two weeks) and short term (immediately after training). One-way ANOVA, Kolmogorov-Smirnow, and Post hoc comparison were used to analyze the data for the effect of glossing and different modes of glossing. In addition, participants' perceptions and attitudes towards different gloss modes were evaluated via a face-to-face interview and 5- point Likert-scale questionnaire.

The purpose of presenting this chapter is to discuss the research findings according to the literature. The chapter consists of three parts. In the first part, the results of gloss impact in long term and short term recall are reviewed with contradictory and supportive discussions. The first part deals with research question 1. In the second part, the effect of glossing on long term and short term retention is discussed in two sections: (a) relation of findings to existing literature, and (b) relation of findings to theoretical frameworks. The second part deals with research question 2. In the third part, the researcher interpreted the participants' perceptions and attitudes about different modes of gloss. The third part deals with the findings of research question 3.

Discussion of Quantitative Results

This part provides a discussion of findings obtained from quantitative questionnaire surveys administered to student participants of the study. Firstly, descriptive results related to students' rating for their instructors' leadership styles are discussed, followed by the discussion of inferential results regarding the relationship between participant ratings and demographic variables. The last two discussion sections are based on the correlation of instructors' perceived leadership styles with leadership outcomes, and learner autonomy, respectively. The results are compared and contrasted with relevant previous research in literature.

The results of gloss impact illustrated that the technique of gloss was more effective than the non-gloss situation for EFL learners' vocabulary learning and retention in the short term in vocabulary tests. Also, the results of this study indicated that glossing enhances the learning of new words. When EFL learners encountered new target vocabularies in a text, their attention was raised through different glossing modes, and as a result, the lexical items would be processed better in the memory.

Regarding the positive effect of gloss, the literature has indicated that gloss draws students' attention to target vocabularies and also encourages them to do the meaning process of target vocabularies by creating input enhancement and raising consciousness (Namaziandost, et al., 2020; Ramezanali, 2017). The present study results indicated that glossing enhances new word learning. It might be due to the fact that when participants face new vocabularies in a text, they pay attention to the words via different glossing conditions, and it result in better lexical items processing in the mind. Therefore, the lexical items processing may increase learners' awareness of the new vocabularies and encourage vocabulary learning. The other issue that increases the impact of gloss and enhances vocabulary acquisition is that it can speed up the identification of words and help students to devote a capacity of the working memory for text comprehension and vocabulary processing. Additionally, learning new vocabularies through different modes of glossing can provide students with multiple learning to unfamiliar vocabularies, and thus increase retention of words. This finding coincides with the results of the previously conducted studies (Al-Seghayer, 2001; Babaie & Razmjoo, 2015; Erçetin & Varol, 2016; Hong, 2010; Jones, 2003; Ko, 2017; Namaziandost, et al., 2019; Nation, 2013; Ramezanali & Faez, 2019; Schmitt, 2010).

According to the result of this study, the use of glosses only in the target language does not allow learners to infer the meanings of new vocabularies', a way that may result in an incorrect inference, in particular for readers who are not fluent in the target language. Therefore, the gloss strategy in this study is intended to put participants in the face of the desired words

through various glossing modes in such a way that the students make accurate guesses when they engage with the text and enhance the retention of vocabularies. Research has indicated that using gloss may save students' time when they are reading a text and provide different preferences for learners.

Developing autonomy of students and less dependence are other benefits of using gloss that encourages learners to take responsibility for understanding the text by engaging with new vocabularies in a text (Gardner, 2011). Since the class time is limited to teach all the new words, the use of glossing in this study can help the EFL learners to know how to use this useful strategy to learn new vocabularies in the future.

The findings of the experimental study of Lomicka (1998) revealed that the students in the intermediate level chose definition gloss instead of other types of gloss, probably because they did not find out "the relevance of the other glosses in helping them with the reading process" (p. 48).

Chen (2016) stated that "Reading authentic texts is more manageable and enjoyable" (p. 413). In the not-too-distant future, glossing will replace dictionaries and enables readers to better use complicated and authentic texts (Chen, 2016; Nation, 2013; Williams et al., 2002; Yanguas, 2009).

Coinciding with the glossing technique benefits for reading comprehension and vocabulary acquisition, findings of Erçetin and Sakar (2005) were in line with the findings of the present study in such a way that gloss modes made the students motivated because the students had accessibility to the target vocabularies in a variety of ways. Similarly, the EFL learners in this study achieved the meanings of glossed vocabularies via different glossing methods that helped the students retrieve the words longer and understand the passages better. In sum, the findings of studies (as discussed before) affirmed that the gloss technique is a practical new word learning strategy to increase retention and learning of vocabulary in the short term.

The in-sum test comparisons results (glossing impact) of this study indicated that the glossing technique was effective for vocabulary retention of EFL learners in MC and PR vocabulary tests from pretest to delayed posttest. The students had some increase in their scores from the pretest to delayed posttest, which indicated that in long term the gloss was efficient for new word learning and retention. Yet, this increase was small because only learners in groups A and C had better scores than groups D and B in the delayed posttest.

However, if EFL learners have enough exposure, input, and concentration after learning intentional or explicit vocabulary, this word gain is greatly integrated, and can help the learners make semantic connections between the glossed vocabularies and definitions of the words (Schmitt, 2010).

The finding coincides with the results of the previously conducted studies (Laufer & Rozovski-Roitblat, 2015; Schmitt, 2010; Yoshii, 2014). According to Schmitt (2010), interaction and a time period a participant spent on a word task can lead to effective vocabulary recall and retention. Nevertheless, as Laufer and Rozovski-Roitblat (2015) make clear, in the case of the vocabulary, it should be clear that how many exposures or encounters a participant needs to learn words successfully; "The more demanding the type of knowledge is; the more exposures are needed in the same task type" (p. 708). Therefore, intentional and explicit vocabulary training of new words can help increase knowledge of word and long term retention. Further, according to Schmitt (2010) "a component which maximizes repeated exposures to lexical items" (p. 334). In addition, as empirical studies indicate, only a small number of new vocabularies can be protected from reading exposure if no further actions are followed in vocabulary learning practices. Therefore, any approach to vocabulary learning can include several activities and tasks that focus on the words, which in the long term leads to better retention of words and enhances students' participation motivationally and cognitively.

The use of integrated ways like word-based activities shortly after training and exposing participants to reading texts can help students to remember the words when required in the long term (Wesche & Paribakht, 1999). The reason why students in this study show a relative increase or improvement from pretest to delayed posttest may be due to low encounters or exposure to the new vocabularies and a shortage of support and practices of new words as well as after reading tasks.

In addition, the present study findings are justifiable by relying on some studies (Jung, 2016; LeBlanc & Bell, 2000) that report the negligible effect of gloss technique on retention of EFL learners in the long term, or the glossing ineffective role for reading comprehension and acquisition of vocabularies.

In sum, according to Schmitt (2010), the gloss technique is one of the practical techniques that focuses "explicit attention to lexical items during exposure" (p. 352), and it integrates the association of meaning and form that has a key role in vocabulary retention.

The study indicates that gloss modes can be used as a tool to enhance word learning to help students to induce the meaning of some vocabularies that according to Wang (2016) "may not be easy to be inferred or guessed correctly from any of the contexts in which the words

appear" (p. 300). According to him, it is very difficult to guess the meaning of words that are conceptual, this problem can be greatly improved with the help of glossing technique.

In addition, glossing simplifies new word acquisition, facilitates comprehension of reading text and encourages EFL learners for more readings. According to the results of the present study and findings of some researchers (Arpaci, 2016; Öztürk & Yorgancı, 2018), students can do further vocabulary processing, leading them to memorize more words. According to Schmitt (2010), any activity in the language learning area that includes vocabulary can improve students' engagement and participation in the use of words, thus leading to vocabulary retention and word learning. Finally, consistent with the findings of Yoshii (2014), in this study, participants were able to retain some of the words from pretest to posttest, but they should reinforce the vocabularies after learning during the two-week gap (Yoshii, 2014). In other words, factors such as the use of new vocabularies by learners after reading, or in writing and speech, have a positive effect on vocabulary gains in the long term. (Newton, 2013; Webb & Chang, 2015).

The Effect of Gloss Modes on Vocabulary Retention in Short Term: MC & PR Tests

The sub-test comparison findings (the effect of different gloss types) indicated that, for the PR vocabulary test, the three modes of glossing (L1 gloss, L2 gloss, & pictorial gloss) were effective for all three experimental groups. Also, different gloss types were efficient for participants' vocabulary retention and learning in a short time. The findings of research question 2 for both MC and PR tests were consistent with the studies that found the preference of different gloss techniques over non-gloss conditions for vocabulary retention and learning in the short term.

In terms of the impact of different glossing types on students' new word learning, findings of short term and long term vocabulary retention can be discussed cautiously and tentatively. Presenting target words with the definition of words (L1 gloss) and visual definition (pictorial gloss) is more effective than providing the text with target vocabularies. This finding coincides with the results of the previously conducted studies (Plass & Chun, 1996; Salem, 2006; Tseng & Lin, 2012; Wang, 2016; Yanagisawa, et al., 2020; Yoshii, 2014). The facilitating effects of gloss types were evident in MC and PR tests in which students had better performance on the immediate and delayed posttest, which means the gloss types had an impact on participants' long term and short term vocabulary retention and learning. As a result, using different types of gloss was completely more effective than no gloss situation. The next section discusses gloss modes in the short term and long term. In the first part, the researcher considers the effect of gloss in a few test sessions.

The Relationship between Surveys and Findings in the Literature

With the incorporation and advancement of technology in the field of new word learning through gloss techniques, glosses are beyond the simple textual definitions (Chen, 2016) and visual (graphics, pictures, videos) modes to name just a few (Al-Seghayer, 2001; Erçetin & Sakar, 2005; Erçetin & Türk, 2014; Yanguas, 2009). Empirical studies have shown the positive impacts of different modes of gloss on EFL learners' word retention and learning (Al-Seghayer, 2001; Choi, 2016; Eshghavi, 2020; Ramezanali, 2017; Salem, 2006).

Effectiveness of Glossing Modes in Test Sessions

The participants were likely to find it easy to use simple text glosses to understand the words in relation to different types of gloss although they have been exposed to different gloss methods. The present finding coincides with the results of the previously conducted studies (Biria & Farvardin, 2012; Chen, 2016; Chen & Teng, 2017; Erçetin, 2003; Laufer & Rozovski-Roitblat, 2015; Öztürk, 2007; Yoshii, 2014). It means that definitions of vocabularies were the learners' favorite mode, leading to better vocabulary retention and learning (Al-Seghayer, 2001; Eshghavi, 2020; Plass & Chun, 1996; Shiki, 2008).

The participants preferred L1 definition mode over L2 definition and pictorial gloss. In other words, the participants could not clearly understand some of the glossed words' meaning presented through pictures, and this affected their scores in delayed posttest. They performed poorly on the MC and PR delayed posttests. As a result, the images could not aid participants to retrieve vocabulary in the long run.

The present study findings revealed that, in general, L1 glossing was more effective in both MC and PR tests for EFL learners' vocabulary retention and learning. One factor that may affect the present study finding is the incompatibility of the presentation of words with the evaluation method. The learners were trained through a learning environment where the target vocabularies were presented through the screen. According to Erçetin (2003), learner test performance may be different if training and testing modes are compatible.

Discussion of Qualitative Results

Attitudes and Perceptions of Learners

Face-to-face Interview and Questionnaire.

The findings of face-to-face interviews and questionnaires revealed that the L1 glossing and pictorial glossing were more favorable than the L2 gloss for EFL learners' word retention and learning in the long term and short term. The learners believed that the L1 definition and

pictures aided them to learn the words easily and helped them to better recall new vocabularies in a long period of time, and they were eager to use L1 and pictorial glossing techniques in the future to learn vocabulary. In previously conducted studies (Erçetin & Sakar, 2005; Eshghavi, 2020; Wang, 2016), it was found that the L1 definition aided EFL learners to learn the words easily and helped to better recall new vocabularies.

Due to the efficiency of L1 gloss mode, in the present study, 65% of the learners evaluated this method as a practical strategy for easy learning of new words; about 51% of the learners declared that the L1 gloss aided them to remember the vocabulary easily in the long run compared to other gloss types, and 58% of them were interested in using it to enhance their future vocabulary learning.

It was found in this study that around 6% of the learners were eager to learn new vocabulary in the future with the L2 definition gloss mode. Only 13% of the learners thought the L2 gloss type helped them to easily learn the new vocabulary, and just 5% of the participants wanted to use this strategy in the long run. The results were in line with the previous studies (Ramezanali, 2017).

The participants seemed to prefer the L1 gloss over other gloss modes since most of them consider this glossing type as "strongly agree" or "extremely helpful." The findings of the present study are consistent with studies that used face-to-face interviews and questionnaires (Erçetin & Sakar, 2005; Eshghavi, 2020; Wang, 2016) to seek learners' viewpoints and perceptions about the efficiency of annotation types for vocabulary learning usefulness.

In a semi-structured face-to-face interview, the students' comments showed that after two weeks, L1 gloss aided them to retrieve and learn better the glossed vocabularies because the understanding of meaning aided them to maintain the vocabularies in the mind and use them later. Therefore, the participants perceived the pictorial gloss as an important exercise for understanding texts as well as a very enjoyable experience of learning new words. The results of face-to-face interviews coincides with the results of the previously conducted studies (Erçetin & Sakar, 2005; Ramezanali, 2017).

The findings revealed that the L1 glossing and pictorial glossing were more favorable than the L2 gloss for EFL learners' word retention and learning in the long term and short term. The learners believed that the L1 definition and pictures aided them to learn the words easily and helped them to recall the new vocabulary better in long term, and they were eager to use L1 and pictorial glossing techniques in the future to learn their vocabulary. Due to questionnaire and face-to-face interview results, and according to previous studies (Chen & Teng, 2017; Erçetin & Sakar, 2005; Eshghavi, 2020; Ramezanali, 2017; Wang, 2016), it was found that the

L1 definition aided EFL learners to learn the words easily and helped to better recall new vocabulary. Due to the efficiency of L1 gloss mode in questionnaire, 65% of the learners evaluated this method as a practical strategy for learning of new words easily; about 51% of the learners declared that the L1 gloss aided them to remember the vocabularies more easily in the long run than other gloss types, and almost 58% of them were interested in using it to experience their future vocabulary learning. In face-to-face interview, the interviewees agreed that the L1 gloss mode was a beneficial word learning strategy that helped the students acquire the new vocabulary faster and easier. One of the interviewees mentioned that reading a text with first language definition of the new words helped her to do better in the delayed test, as she could relate the meaning of new vocabulary to the related words. She enjoyed her learning experience as she was strongly motivated to learn the words. Another student, mentioned that the new word learning with first language definition (L1 gloss) was a very effective, motivating, and enjoyable experience for vocabulary learning and saving the words in his memory. The other interviewee used L1 glossing as an effective technique for vocabulary learning. This technique enabled her to learn new vocabularies and gave the opportunity to repeat the target vocabularies many times to recall and remember the words in long term.

As a result, the participants' comments indicated that EFL learners understood the L1 definition gloss as the effective and beneficial new word learning strategy for vocabulary learning. Furthermore, compared to the L1 glossing, the pictorial gloss strategy had little effect on EFL learners, but it was more impressive than L2 glossing. It was found that around 6% of the participants were interested in using the L2 gloss for later efforts to learn new words. Only 13% of the participants considered that L2 gloss helped them to learn the new vocabulary, and just 5% of the participants confirmed that they wanted to use this strategy in the long run. The participants seemed to prefer the L1 gloss over two other gloss modes because most of them considered this annotation type as "strongly agree" or "extremely helpful." One of the interviewees mentioned that reading a text with L1 gloss extremely helped him. He used to get anxious while reading texts because he might not understand the meaning of new words. He always had to use a dictionary. While using the dictionary, he came across several meanings that did not know which one to choose for the current word in the text. But with the help of L1 gloss technique, this problem was completely solved for him. The findings of the present study were consistent with research that used face-to-face interviews and questionnaires to seek learners' viewpoints and perceptions about the efficiency of annotation types for vocabulary learning usefulness (Erçetin & Sakar, 2005; Wang, 2016).

According to qualitative and quantitative results, the three gloss modes were effective in vocabulary retention and learning of EFL learners. However, for EFL learners' new word learning, the first language definition (L1) gloss and pictorial gloss were the first and second preferred new word presentation modes in the long run. The participants' least preferred choice was L2 gloss. In addition, the study findings suggest that the availability of the information (L1 definition, L2 definition, & pictorial glossing) may support the ability of EFL learners to make connections between new words and visual definitions in short term memory, therefore, it provides the base for the efficient detection of vocabularies stored in the long term memory. This finding coincides with the results of the previously conducted studies (Erçetin & Sakar, 2005; Eshghavi, 2020; Ramezanali, 2017; Wang, 2016).

Summary of the Chapter

In this chapter, the researcher discussed the findings of this study according to the theoretical frameworks and relevant literature. Initially, the research findings related to the effect of different gloss types in the long and short term were discussed and overviewed. The researcher is of the opinion that since the gloss technique provided adequate context for learners, drew their attention to unknown vocabularies, saved learners' time and effort, and helped them process the text for comprehension, it was effective for vocabulary retention and learning. Besides, the researcher explained the assumption that the gloss technique can be effective for long time retention in case of sufficient exposure.

Then, the results of gloss technique effects in a short time and a long time, and the findings of face-to-face interview, looking at the attitudes and perceptions of the participants regarding the use of glossing for vocabulary retention and learning, and questionnaire were reviewed and discussed in this chapter. The next chapter provides the summary of the main findings and a brief discussion of each section. In the next section, the researcher discusses educational and research concepts and offers recommendations for future research in this field, and concludes this dissertation.

CHAPTER SIX

Conclusion

Overview of the Study

The aim of this study is to evaluate the effect of the gloss technique on EFL learners' word retention and learning in a short term and long term. To this end, 80 intermediate-level language learners were divided into three experimental groups (A, B, & C) and one control group (D). Different reading passages in three gloss modes of the first language (L1), target language (L2), and pictorial gloss were given to the experimental groups. Group D (the control group) had the same reading text with no gloss. At the beginning of the study, a Vocabulary Levels Test was performed to clarify the learners' homogeneity and to measure their familiarity with the glossed vocabularies. The EFL learners in the present study received the instruction every other day in a week, and after that, they were given immediate posttest to investigate their vocabulary retention and learning in the short term. After two weeks, the same posttest with a different format was used to measure EFL learners' vocabulary recall in the long term.

The researcher explained the basic framework, review of the related literature, research methodology, findings of the study, and checking the results in the previous chapters. The researcher re-states each research questions with a brief overview of the main findings in this chapter. This chapter discusses five main parts as follow: (1) summary of the main research findings, face-to-face interviews and questionnaires, (2) pedagogical implications, (3) implications of the research with respect to future studies, (4) limitations of the study, and (5) the concluding section on how this study fills the literature gap.

Main Findings' Summary

There were four research questions in the present study. The first research question was about the effectiveness of the gloss types (L1, L2, & pictorial) on EFL learners' word learning. The second and third research questions examined which gloss type(s) was effective for EFL learners' vocabulary retention and learning in the long and short term. The fourth research question asked about language learners' perceptions and attitudes towards learning through gloss modes. The next part reviews the main findings of each research question and supports the survey in the theoretical frameworks and literature.

Support from the Study in Literature and Theoretical Frameworks

The first research question was about the gloss effectiveness for EFL learners' new word learning and retention. To investigate the first research question, the total scores of participants, for short term vocabulary retention, were analyzed from the pretest to immediate posttest, and for long term vocabulary retention, they were compared from the pretest to delayed posttest. The findings for both Productive Recall and Multiple-Choice tests revealed that the gloss technique for EFL learners' short term recollection and vocabulary learning was more effective than a non-glossing strategy, but it was somewhat effective for learners to learn new words in the long- term. The findings are consistent with former research indicating that the gloss technique is an applied new word learning strategy to increase vocabulary retention and learning in the short term and facilitates new word learning in the long term if vocabularies are reinforced adequately after learning (Arpaci, 2016; Plass & Chun, 1996; Yoshii, 2014) via repeating and exposing to the vocabularies such as doing several exercises/activities after reading (Newton, 2013; Webb & Chang, 2015).

In order to answer the second research question, the effect of different modes of gloss was compared by investigating the test scores of participants from the pretest to immediate posttests for short term effect, and another time from pretest to delayed posttest for long term effect. The findings revealed that the L1 gloss mode was effective in short term vocabulary retention and learning, and all three gloss modes were effective in the research. Besides, in multiple-choice tests, different types of gloss were similarly effective for EFL learners' short term new word retention and learning. However, in terms of vocabulary learning and retention for a long time, the results of the productive recall test and the multiple-choice test revealed that the L1 definition gloss was effective in all test sessions. However, the findings of productive recall and multiple-choice tests in short term and long term are consistent with other studies showing that the L1 gloss mode is more effective than pictorial gloss mode and L2 gloss mode to help EFL learners with new word retention and learning (Chen & Teng, 2017; Salem, 2006; Tseng & Lin, 2012; Wang, 2016; Yoshii, 2014). Altogether, the following factors could be mentioned about the effect of L1 gloss mode compared to L2 gloss and pictorial gloss: (a) more cognitive load for EFL learners for text processing when presented with L1 gloss mode in comparison with pictures or L2 glossing, (b) learners' proficiency level, (c) participants' lack of attention to the pictorial annotations, (d) the types of vocabularies to be expressed as gloss, (e) the text to be presented, and (f) type of assessment measures. The findings revealed that L1 glossing mode, that is, the presentation of new words definition in learners' mother tongue, led to better vocabulary retention and learning than L2 gloss or pictorial gloss.

In chapter five, the other issue was the participants' scores from the pretest to the delayed posttest. The results showed that participants had some progress from pretest to immediate posttest, revealed some decreases in scores from immediate posttest to delayed posttest. Although, compared to the productive recall test, the vocabulary learning from pretest to delayed posttest was greater in the multiple-choice test. A possible reason could be the test tool was used to evaluate participants' word gain after training and after two weeks. Completing the multiple-choice test may be easier for the participants than the productive recall test and may not adequately measure learners' vocabulary retention and learning. Multiple-choice vocabulary tests, as a tool to assess participants' receptive vocabulary knowledge, have a probability of 25% chance for the learners to guess the word correctly. In comparison to the productive recall vocabulary test, the multiple-choice test leads to participants' higher scores (Stewart, 2012). The other factor that could have contributed to the higher scores of learners on the multiple-choice delayed posttest compared to the productive recall test was the same amount of time spent on each vocabulary task. Although the results of the tests revealed that the estimated time was suitable to complete the tests, participants in this study might need more time to complete the productive recall test, because they were concerned with remembering the spelling of the vocabularies and write the correct words in the blanks provided. Therefore the given time was not enough to make the productive recall task, and as a result, participants gained lower scores compared to the multiple-choice test. As a result, the three different gloss types were effective in productive recall and multiple-choice tests because immediate and delayed posttest may contribute to the test nature. The productive recall test required the learners to rely on their memory to extract words, while the multiple-choice test was easier for the participants to process (Erçetin & Türk, 2014).

Face-to-Face Interview and Questionnaire

The fourth research question asked about learners' attitudes and viewpoints towards the glossing technique. The questionnaire asked the preference of learners on different gloss types and their rationale for choosing them. The face-to-face interview and the questionnaire findings to help the participants acquire and retain new vocabularies in long term and short term memory showed that the L1 gloss and pictorial gloss were more desirable than the L2 gloss. The findings of face-to-face interviews and questionnaires revealed that the L1 glossing and pictorial glossing were more favorable than the L2 gloss for EFL learners' word retention and learning in the long term and short term. The learners believed that the L1 definition and pictures aided them to learn the words easily and helped them to recall the new vocabularies better in long term, and they were eager to use L1 and pictorial glossing techniques in the future to learn their

vocabulary. Due to the efficiency of L1 gloss mode, more than half of the learners evaluated this method as a practical strategy for learning of new words easily; about half of the learners declared that the L1 gloss aided them to remember the vocabularies more easily in the long run than other gloss types, and they were interested in using it to experience their future vocabulary learning. It was found that very few participants were interested in using the L2 gloss for later efforts to learn new words. Only very few number of the participants considered that L2 gloss helped them to learn the new vocabulary, and just 5% of the participants confirmed that they wanted to use this strategy in the long run. The participants seemed to prefer the L1 gloss over two other gloss modes because most of them considered this annotation type as "strongly agree" or "extremely helpful." The findings of the present study are consistent with research that used face-to-face interviews and questionnaires to seek learners' viewpoints and perceptions about the efficiency of annotation types for vocabulary learning usefulness (Erçetin & Sakar, 2005; Wang, 2016).

The findings of the questionnaire also revealed that participants' verbal preference was stronger than their visual preference for word learning (Wang, 2016). In the present study, 20% of the participants thought pictorial glossing helped them to learn the vocabularies; 15% of the participants accepted to use this strategy in long run. About 11% of the participants wanted to practice pictorial glossing for their new word learning in the future. The participants had a positive view towards the pictorial gloss and considered it as their second preferred type of annotation. In face-to-face interviews, some of the comments indicated that L1 gloss aided them to retrieve and learn the glossed vocabularies because the understanding of meaning aided them to maintain the vocabularies in mind and use them later. Therefore, the participants perceived the pictorial gloss as an enjoyable technique for understanding texts and a good experience of learning vocabulary (Erçetin & Sakar, 2005).

Pedagogical Implications

The educational implications of this study are for the teachers, language learners, and syllabus designers. The findings showed that gloss techniques were beneficial for improving EFL learners' new word retention and learning. In addition, generally, L1 gloss mode encouraged word recall and learning more effectively than pictorial gloss. The following hints should be considered when presenting and using educational content including gloss in EFL classes:

1. Providing definitions of new words in learners' mother tongues makes vocabulary learning easier to learn and reduces the extra cognitive load on them (Erçetin & Türk, 2014). Syllabus designers and material developers, as well as teachers, should pay

attention to the principle of temporal proximity of learning via glossing. This principle states that providing verbal definitions of new words in learners' mother tongue decreases cognitive load and enhances learning.

2. The use of gloss techniques in language classes requires teachers to familiarize and train the students with gloss in advance. Although the language learners included this study individually had no role in choosing gloss modes, it is recommended that, in other language learning environments, teachers encourage EFL learners to use different gloss types when accessing new vocabularies (Erçetin & Türk, 2014).
3. The aim of the present study was to encourage learners to expand their vocabulary knowledge and use new words for a long time by exposing them explicitly and intentionally to new vocabularies by different types of gloss. However, due to the goals of language learning, in terms of learning new words, suitable strategies should be considered. If the ultimate goal of this course is to learn the new vocabularies and retain them over a long period of time, then intentional new word learning is accepted. This is followed by exercises and activities that focus on words so that learners can establish a relationship between form and meaning, reinforce word retention and learning, and guess the words correctly (Laufer & Rozovski-Roitblat, 2015). Therefore, to strengthen the bond, gloss can play a mediator role in providing students with frequent encounters and interaction.
4. Teachers and material developers should consider the use, applicability, and usefulness of pictures in the class before applying them. Given the time spent on designing the class curriculum, and the time constraints of the classroom, preparing pictures for gloss words would be time-consuming. However, selecting the images that certainly have the same definition derived from new words is difficult. Although images may be one of the most attractive tools for learning/teaching vocabulary to attract the attention of learners to a large extent, finding suitable images, adjusting and preparing them according to the learners' needs, and their compliance with the course requirements may take hours to be prepared.
5. Content developers need to keep in mind that in designing vocabulary lessons, choosing images for vocabulary glossing may be limited to a set of some limited adjectives, action verbs, and objective/concrete nouns. Moreover, it will be difficult to teach other words like stative verbs, abstract nouns, and adverbs through appropriate pictures.
6. In preparing vocabulary content for instruction, language teachers and content developers need to consider differences in the learning process of language learners.

Plass et al. (1998) stated that the verbalizer-visualizer dimension describes the difference between students in acquiring and processing verbal versus visual data.

Implications of the Research**:**

In the present study, the effect of gloss modes on vocabulary learning has been investigated in terms of both long term and short term new word recall and learning. Three different gloss types, placed in the text, were compared in this study. Research in the future is needed to fully confirm the suitability of glosses for new vocabulary learning. The following provides guidelines for future study in this area:

1. This study used text definitions and images to illustrate the meaning of new and unknown vocabularies. For future studies, videos can be added to the research to examine the effect of visual and verbal gloss modes on EFL learners' new word learning.
2. The aim of this study was to investigate the learning of vocabulary by intentionally teaching the glossed vocabularies via different types of glossing regardless of the learners' performance on reading comprehension. However, future studies could enhance implicitly/incidentally word learning by providing authentic texts for participants without knowing the subsequent vocabulary measurements or compare the two approaches (intentional vs. incidental) and as another variable, compare the reading comprehension skills of learners.
3. Other variables like different preferences and language learners' learning styles such as verbalizers and visualizers, and investigating how differences in their learning behavior would lead to various findings. The verbalizer-visualizer dimension is related to learners' differences when accessing and processing visual versus verbal information (Plass et al., 1998). In the present study, Plass et al. found that visualizers benefit from visual representations of pictorial glossing whereas verbalizers prefer verbal modes, suggesting the importance of considering the individual differences for vocabulary learning with different gloss types.
4. This study considered gloss mode as a technique for new word retention and learning. Therefore, in future studies in this field, there would be an open area that examines and compares the effect of gloss presentation on new word retention and learning via successive and simultaneous situations.
5. In future studies, researchers can focus on comparing the computer-based glossing mode conditions and paper-based glossing mode because these two situations may have different and interesting outcomes. In traditional gloss, the glossed vocabularies

are presented within the text, in the margin, or along with pictures on the paper. On the other hand, multimedia gloss linked the new vocabulary with animations and audio files. Investigating participants' performance in these learning situations may enhance current insights from gloss studies.

6. The present study was performed in a monolingual EFL context in which participants shared Persian as their official language. Another study is required on multicultural ESL context in which language learners, from different linguistic and cultural contexts, use multimedia tools to learn and retain new vocabularies.
7. In this study, because of the ease of finding images, the researcher selected concrete nouns as gloss vocabularies in the context. In future research, rather than using nouns alone, other words like adjectives and verbs can be used in the texts.
8. In the present study, all participants were aged 14 to 19 years. It will be interesting to examine EFL learners of different ages to find out the effect of different types of gloss on their new word retention and learning. In the present research all the participants were in interediate level, in the future study advanced level students can be examined in different gloss situations. Children with different learning characteristics and lower cognitive abilities may have different learning outcomes (Acha, 2009).

Limitations of the Study

Some limitations in this study are as follows:

1. This study allocated a time limit of 15 minutes to complete the productive recall test. However, if the response time was longer, participants could complete items of the test on time and it could influence their performance. Productive recall tests need more mental processing to produce and retrieve the vocabulary for the learners. Learners may rely on the power of guessing to find the right answer in multiple-choice tests. Therefore, the results may be different if more time is devoted to completing productive vocabulary measurements.
2. This study was performed at participants' homes with a personal computer, laptop, or mobile phone. However, the performance of the participants might have changed, and the effect of gloss modes might be different if the EFL learners participating in the study had received the gloss instructions in a classroom setting.

3. Due to time construction for data collection, this study considered two weeks as a long time. The different types of gloss effectiveness can be tested for a longer time (for example, two months).

To verify the effectiveness of the gloss technique in word retention and learning of EFL learners in a long and short time, the present study is located in two theoretical frameworks of cognitive learning theory and dual coding theory (Mayer, 2014; Paivio, 1991). This research tried to answer the research questions about the effectiveness of gloss, and different modes of gloss. The glossing effectiveness was evaluated by comparing the test and the effect of different modes of glossing on vocabulary retention and learning. The score of the participants in tests for short-time effect was considered from the pretest to the immediate posttests, and for long-time retention from the pretest to the delayed posttest. The perceptions and attitudes of learners were assessed through questionnaires and face-to-face interviews. The findings of the study were supported by the literature in the field of gloss and new words retention and acquisition.

The present study is worth considering because it has established insight into the retention and learning of new words. Despite the limitations, the present study filled the literature gap in the following ways:

- In this study, the researcher tried to address the role of the gloss technique in facilitating new word learning and increasing vocabulary recall in a long time. Overall findings showed that mother tongue gloss mode is more efficient than target language gloss mode to improve EFL learners' word retention and acquisition in a long time.
- According to the results of the study, among different gloss types in a computer-based learning situation, the definition of text in mother tongue (L1) was more efficient and preferred than the pictorial gloss and target language (L2) gloss. The reason was that with the mother tongue gloss, the EFL learners could easily understand the concept and the text. Therefore, the L1 gloss mode, by defining the target vocabularies in the participants' mother tongue, may have led to the redundancy effect, and influence the learners' learning.
- The study design and its methodological approaches were the other things that added to this field in which mixed methods research were used to evaluate the effect of different types of gloss via examining participants' scores on the pretest, immediate, and delayed posttest and their attitudes and perceptions towards gloss technique.

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APPENDICES

Appendix A: Information Letter & Consent Form (Pilot study)

Title of the Project

The Effect of Different Types of Marginal Glossing on EFL Learners' Vocabulary Learning

Investigator of the Study Name: Mahdieh Karimvand

I have read the Information Letter, the nature of the study has been explained to me, all questions have been answered to my satisfaction, and I agree to participate.

Date:

Name of the Participant:

Signature of the Participant:

Person Who Recieves Informed Consent Mahdieh Karimvand

Date:

Signature:

Appendix B: Form of Demographic Information

Form of Demographic Information

Please answer the following questions.

1. What is your gender? M…… F……

2. How old are you?

3. How long have you been studying English?

4.What other languages can you speak (other than English)?

Appendix C: Reading Text (The Secrets of a Very Long Life)

The Secrets of a Very Long Life

There are several places in the world that are famous for people who live a very long time. These places are usually in mountanious areas, far away from modern cities. Doctors, scientists, and public health experts often travel to these regions to solve the secret of a long, healthy life; the experts hope to bring to the modern world the secrets of longevity. Hunza is high in the Himalayan Mountains of Asia. There, many people over one hundred years of age are still in good physical health. Men of ninety are new fathers, and women of fifty still have babies. What are the reasons for this good health? Scientists believe that the people of Hunza have these three benefits: (1) physical work, usually in the farm or with animals; (2) a healthful environment with clean air and water; and (3) a simple diet high in vitamins and nutrition but low in fat, sugar, chemicals. People in the Caucasus Mountains in Russia are also famous for their longevity. In this area, there are amazing examples of very long – lived people. Birth records are not usually available, but a woman called Tsurba lived until age 160; a man called Shirali lived until 180. In general, the people not only live a long time, but they also live well. They are almost never sick, and when they die, they have not only their own teeth but also a full head of hair, and good eyesight. Vilcabamba, Ecuador, is another area famous for the longevity of its inhabitants. This region –like Hunza and the Caucasus – is also in high mountains far away from cities. In Vilcabamba, too, there is very little serious disease. One reason for the good health of the people might be the clean, beautiful environment: The temperature is about 70 Fahrenheit all year long; the wind always comes from the same direction; and the region is rich in flowers, fruits, vegetables, and wildlife.

In some ways, the diets of inhabitants in the three regions are quite different. Hunzukuts eat mainly raw vegetables, fruit (especially apricots), and chapaties, they don't use junk foods and eat meat only a few times a year. The caucasion diet consists mainly of milk, cheese, vegetables, fruit, and meat. In Vilcabamba, people eat a small amount of meat each week, but the diet consists largely of grain, corn, potatoes, and fruit.

However, the diets are similar in two general ways: (1) the fruits and vegetables that the inhabitants of the three areas eat are all natural; that is they contain no chemicals; and (2) the people consume fewer calories that people do in other parts of the world. A typical North American takes in an average 3,300 calories every day; and a typical inhabitant of these mountainous areas, between 1,700 and 2,000 calories. Inhabitants in the three regions have more in common than calories, natural food, their mountains, and their distance from modern cities. Because these people live in the countryside and are mostly farmers, their lives are physically hard. Thus, they do not need to go to health clubs because they get a lot of exercise in their daily work. In addition, although their lives are hard, the people do not seem to have the worries of city people. Their lives are quiet. Some experts believe that physical exercise and freedom from worry might be the two most important secrets of longevity.

Appendix D: L1 Gloss Group

L1 Glossing

Mountainous areas = مناطق کوهستانی

Health expert =متخصص سلامت

Region =ناحیه

Longevity =طول عمر

Benefits = مزایا

Nutrition =تغذیه

Fat =چربی

Chemicals =مواد شیمیایی

Available =در دسترس

Inhabitants =ساکنین

Serious =مهم

Temperature =دما

Diet =غذای روزانه

Raw vegetables =سبزیجات خام

Apricots =زرد آلو

Chapatis =نوعی نان

Grain =غلات

Corn =ذرت

Countryside =حومه شهر

Health club =باشگاه ورزشی

Worry =نگرانی

Quiet =ساکت و آرام

Appendix E: L2 Gloss Group

L2 Glossing

Mountainous areas = having a lot of mountains

Health expert= a person with a high level of knowledge or skill relating to health problems

Region = area

Longevity = living for a long time

Benefits = a helpful or good effect

Nutrition = the substances that you take into your body as food and the way that they influence your health.

Fat = the substance under the skin of humans and animals that stores energy and keeps them warm

Chemical = any basic substance that is used in or produced by a reaction involving changes to atoms or molecules

Available = able to be obtained, used, or reached

Inhabitants = a person or animal that lives in a particular place

Serious = not joking or intended to be funny

Temperature = heat

Diet= the food and drink usually eaten or drunk by a person or group

Raw vegetables = not cooked vegetables

Apricots= a small, round, soft fruit with a pale orange, furry skin

Chapatis = a type of flat, round South Asian bread made without yeast

Grain = a seed or seeds from a plant, especially a plant like a grass such as rice or wheat

Corn = (the seeds of) plants, such as wheat, maize, oats, and barley, that can be used to produce flour

Countryside = land not in towns, cities, or industrial areas, that is either used for farming or left in its natural condition.

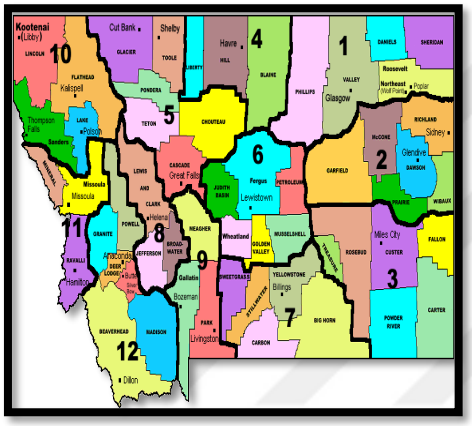
Health club = an organization of people with a common purpose or interest about health

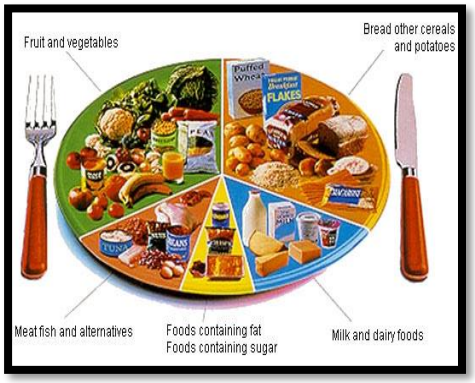
Worry = think about problems that makes you feel unhappy and frightened

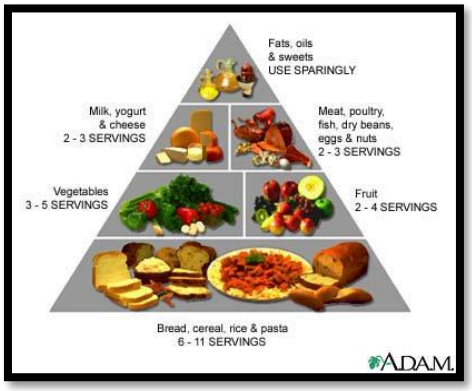
Quiet = calm and less noisy

Appendix F: Pictorial Gloss Group

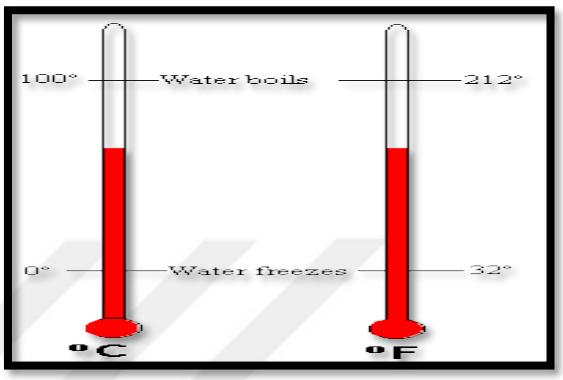
Pictorial Gloss

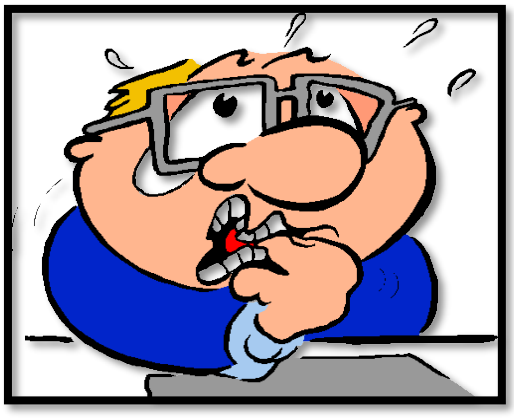







Important!


100°
Water boils
212°
0°
Water freezes
32°
°C
°F



Appendix G: Vocabulary Levels Test (VLT)

Vocabulary Levels Test

Write a short definition (L1 or L2) for each word:

1. Apricots
2. Available
3. Basket
4. Beach
5. Bend
6. Benefits
7. Chapatis
8. Chemicals
9. Cloud
10. Corn
11. Countryside
12. Dance
13. Decorate
14. Diet
15. Doorbell
16. Farm
17. Fast
18. Far
19. Fat
20. Feeling
21. Garlic
22. Glass
23. Grain
24. Grow
25. Health club
26. Health expert
27. Home
28. Income
29. Inhabitants
30. Juice
31. Lake
32. Live

33. Longevity
34. Men
35. Mistake
36. Mobile
37. Model
38. Modern
39. Mountainous areas
40. Nest
41. Nutrition
42. Percent
43. Present
44. Quiet
45. Raw vegetables
46. Region
47. Serious
48. Surprise
49. Shine
50. Snow
51. Sunflower
52. Temperature
53. Threat
54. Under
55. Wet
56. Worry

Appendix H: Pretest Productive Recall Vocabulary Test

Productive Recall Vocabulary Test

Instruction: Please read the definitions, and write the word in the space provided.

1. A region with a lot of huge rocks ……
2. Long existence or service ……..
3. Food or nourishment……
4. The kinds of food that a person, animal, or community habitually eats…….
5. A natural oily substance occurring in animal bodies, especially when deposited as a layer under the skin or around certain organs…….
6. A distinct compound or substance, especially one which has been artificially prepared or purified……..
7. A person or animal that lives in or occupies a place…….
8. The land and scenery of a rural area……..
9. Wheat or any other cultivated cereal used as food……..
10. Representative as a symbol; symbolic……...
11. Doctors and scientists study certain people to learn their …… of long life.
12. The areas of the world where people live a very long time are usually near …..……, and the weather is…….
13. There is one main reason for the good ……..and long lives of these people.
14. According to ……., most people in these regions don't eat junk food and smoke cigarettes.
15. The secrets of long life might be lots of ……...

Appendix I: Pretest Multiple-choice Productive Recognition Test

Multiple-choice Productive Recognition Test

Choose the correct one.

1) Doctors, scientists, and public health experts often travel to these places to study the causes of long, healthy life. What are experts?

a) People who live a long time

b) People who know a lot about a subject

c) Students who study at school

d) Travelers to many regions of the world

2) Scientists believe that the people of Hunza have the benefit of a healthful environment with clean air and water. What is an environment?

a) Clean air and water

b) A healthful place

c) A place in Hunza for scientists

d) The conditions in a place that influence people

3) In this area, there are examples of very long – lived people. A woman called Tsurba, lived until age 160.What does long – lived mean?

a) Having a long life

b) Being 160 years old

c) Living in one place for years

d) Being an example

Choose the correct meanings of the vocabulary items.

l*ongevity*

a. long length of life

b. a long time

c. the environment of the mountains

d. health and care

mountainous

a. in the Caucasus

b. in Russia

c. having mountains

d. famous

Inhabitants

a. the people of an area

b. cities

c . the environment

d . Ecuadorians

Region

a. Ecuador

b. area

c. healthy place

d. beauty

Available

a. able to be used or obtained
b. mountains
c. area
d. a kind of food

Serious

a. big
b. important
c. city
d. long time

Quiet

a. leave

b. people

c. group

d. making little or no noise

Raw

a. not cooked

b. good

c. fruit

d. cooked

The food that has few of the nutrients your body needs, and a lot of fat, sugar and salt

a. corn
b. junk food
c. potatoes
d. apricot

A person who focus their careers on developing conditions where people can be healthy.

a. Health expert
b. Inhabitants
c. Chemicals
d. Teachers

A sweet crystalline substance obtained from various plants, especially sugar cane and sugar beet, consisting essentially of sucrose, and used as a sweetener in food and drink.

a. Fat
b. Sugar
c. Apricot
d. Corn

The degree or intensity of heat present in a substance or object, especially as expressed according to a comparative scale and shown by a thermometer or perceived by touch.

a. village
b. Hot
c. Cold
d. Temperature

Appendix J: Posttest Productive Recall Vocabulary Test

Productive Recall Vocabulary Test

Instruction: Please read the definitions, and write the word in the space provided.

1. Food or nourishment……
2. The land and scenery of a rural area……..
3. A region with a lot of huge rocks ……
4. The kinds of food that a person, animal, or community habitually eats…….
5. Long existence or service ……..
6. A distinct compound or substance, especially one which has been artificially prepared or purified……..
7. The secrets of long life might be lots of ……...
8. A person or animal that lives in or occupies a place…….
9. Wheat or any other cultivated cereal used as food……..
10. Representative as a symbol; symbolic……...
11. Doctors and scientists study certain people to learn their …… of long life.
12. A natural oily substance occurring in animal bodies, especially when deposited as a layer under the skin or around certain organs is…….
13. There is one main reason for the good ……..and long lives of these people.
14. According to ……., most people in these regions don't eat junk food and smoke cigarettes.
15. The areas of the world where people live a very long time are usually near …..……,

Appendix K: Posttest Productive Recognition Multiple-choice Vocabulary Test

Productive Recognition Multiple-choice Test

Choose the correct one.

1) Scientists believe that the people of Hunza enjoy the benefit of a healthy environment with clean water and air. What is an environment?

a) Clean air and water

b) A healthful place

c) A place in Hunza for scientists

d) The conditions in a place that influence people

2) In this area, there are examples of very long – lived people. A woman called Tsurba, lived until age 160.What does long – lived mean?

a) Having a long life

b) Being 160 years old

c) Living in one place for years

d) Being an example

3) Public health experts, scientists, and doctors often travel to these places to study the causes of long, healthy life. What are experts?

a) People who live a long time

b) People who know a lot about a subject

c) Students who study at school

d) Travelers to many regions of the world

Choose the correct meanings of the vocabulary items.

Inhabitants

a. the people of an area

b. cities

c . the environment

d . Ecuadorians

Region

a. Ecuador

b. area

c. healthy place

d. beauty

Quiet

a. leave

b. people

c. group

d. making little or no noise

Raw

a. not cooked

b. good

c. fruit

d. cooked

Available

e. able to be used or obtained
f. mountains
g. area
h. a kind of food

Serious

a. big
b. important
c. city
d. long time

l*ongevity*

a. long length of life

b. a long time

c. the environment of the mountains

d. health and care

mountainous

a. in the Caucasus

b. in Russia

c. having mountains

d. famous

A person who focus their careers on developing conditions where people can be healthy.

a. Health expert
b. Inhabitants
c. Chemicals
d. Teachers

A sweet crystalline substance obtained from various plants, especially sugar cane and sugar beet, consisting essentially of sucrose, and used as a sweetener in food and drink.

a. Fat
b. Sugar
c. Apricot
d. Corn

The food that has few of the nutrients your body needs, and a lot of fat, sugar and salt

a. corn
b. junk food
c. potatoes
d. apricot

The degree or intensity of heat present in a substance or object, especially as expressed according to a comparative scale and shown by a thermometer or perceived by touch.

a. village
b. Hot
c. Cold
d. Temperature

Appendix L: Questionnaire

Purpose of the questionnaire

This questionnaire purpose is to better understand your preferences and attitudes towards the three modes of vocabulary training (gloss L1, gloss L2 and pictorial gloss). Participation in this study is voluntary.

For the following questions, please indicate using the scale 1 to 5 how much you disagree or agree with the following:

1= strongly disagree; 2= disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree

	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
1. Learning with L1 Gloss is easy for me.					
2. Learning with L2 Gloss is easy for me.					
3. Learning with Pictorial Gloss is easy for me.					
4. In the final test, it was easier for me to remember vocabularies when instructed by L1 gloss.					
5. In the final test, it was easier for me to remember vocabularies when instructed by L2 gloss.					
6. In the final test, it was easier for me to remember vocabularies when instructed by pictorial gloss.					
7. In the future, I will use the L1 gloss technique to learn new words.					
8. In the future, I will use the L2 gloss technique to learn new words.					
9. In the future, I will use the pictorial gloss technique to learn new words.					

Appendix M: Guide for Face-to-face Interview

You are invited to participate in this interview. Participation in this interview is voluntary. You may refuse to participate. The goal is to find your perceptions of is most useful for learning vocabulary. Not answering the questions will not affect your future academic status.

The following questions are asked of the participants:

1. How many years have you been studying English?

2. What is your strategy for remembering words?

3. What is your strategy to learn vocabulary?

4. What do you think about learning words through glossing technique?

5. Which vocabulary learning technique (L1 gloss, L2 gloss or pictorial gloss) did you prefer/like, and why?

6. In the final test, did the L1 gloss mode help you remember the vocabularies?

7. In the final test, did the L2 gloss mode help you remember the vocabularies?

8. In the final test, did the pictorial gloss mode help you remember the vocabularies?

9. Have the glossing modes practiced here changed the way you used to learn new vocabulary?

CURRICULUM VITAE

Personal Information

Name Surname: Mahdieh Karimvand

Education

Bachelor's Degree: Islamic Azad University, Sarab Branch, Faculty of Education, ELT Department, 2006

M.A. Degree: Islamic Azad University, Maraghe Branch, Institute of Education Sciences, ELT Department, 2012

PhD Degree: Ataturk University, Institute of Education Sciences, FLE Department, 2021

Professional Qualifications:

Languages: English, Persian, Turkish, Azeri

Employment History:

2012 (Still continuing): PayamNoor University, Iran - English Language Instructor

2012 (Still continuing): Translation - English Language Translator

2013- (Still continuing): Private Language Training Institute –English Language Teacher