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The impact of L1 and L2 Glosses on EFL Learners' Incidental Vocabulary Learning Through Reading: A Systematic Literature Review

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Abstract

This systematic literature review investigates the impact of L1 and L2 glosses on EFL learners' incidental vocabulary learning via reading. The review aims to synthesize and analyze existing empirical research on the topic, identify the most effective glossing method, and highlight reasons why some glosses may be more effective. The review's research questions are: (1) How is incidental vocabulary operationalized in these studies? (2) Do L1 and L2 glosses differ in their effect on incidental vocabulary learning? and (3) Why do some learners benefit from one type (L1/L2) of gloss more than the other? The review follows a systematic methodology, involving a comprehensive search using SCOPUS databases, rigorous inclusion/exclusion criteria, and data extraction and synthesis methods. The results suggest that L1 and L2 glosses have a positive effect on EFL learners' incidental vocabulary learning through reading, but there is a lack of consensus on which language is more effective. The review highlights the lack of gloss studies among Arabs.

1. INTRODUCTION

Over the last few decades, researchers in Second Language Acquisition (SLA) have come to an agreement that learners' vocabulary plays a crucial role in enhancing their literacy skills in a second language (Read, 2000; Schmitt, 2008; Webb & Nation, 2017). It is also well-established in the literature that learners need around 9000 word families in order to understand

reading texts and around 7000 for oral discourse (Schmitt, 2008). Given the immense number of lexical items learners need to achieve adequate understanding of written and spoken discourse, many studies have been conducted so as to investigate learners' incidental vocabulary gains through different various instructional means especially reading (Huckin & Coady, 1999; Horst, 2005).

Although explicit instruction may lead to more gains in vocabulary size and depth, the chance of such instruction is scarce in the language classroom (Schmitt, 2008). Schmitt added that reading enhances the chance of encountering and picking up new vocabulary incidentally though the pick-up rate is not high. Huckin and Coady (1999) explained that apart from their first thousand common words, learners acquire vocabulary incidentally through reading by guessing the meaning of unknown words using contextual clues.

Relying solely on contextual clues, however, does not always yield promising results. Laufer (2005) explained that in reading learners do not necessarily focus on the meaning of words when the message of the reading passage is clear. Also, they tend to ignore words that do not seem important for holistic understanding especially when the text is not short. Besides, they may fail to make correct inferences due to the absence of contextual clues, their misleading nature, or their appearance in words that do not exist in learners' lexis. Bearing these shortcomings in mind, research suggests using glosses in order to increase vocabulary learning from reading (Davis 1989; Ko; 2017; Webb & Nation, 2017).

At its outset, supporting reading texts with glosses was meant to widen learners' understanding of authentic texts (Davis, 1989; Jacobs, 1994; Lomicka, 1998; Yun, 2011). For Lomicka (1998), glosses simply "provide a short definition or note in order to facilitate reading comprehension for L2 learners" (p.40). Roby (1999), however, provided a broader definition that includes any attempt to minimize if not eradicate any shortage in the readers' declarative or procedural knowledge. Unlike Lomicka (1998) who limited the utility of glosses to that of helping the reader with understanding the reading text, Roby's definition encompasses, besides other uses, using glosses to enhance the learning of vocabulary. In accordance with the last definition of a gloss, the present systematic review's focal point revolves around the use of L1 and L2 glosses as a technique to enhance EFL learners' incidental vocabulary learning through reading.

While researchers agree that glosses contribute to EFL learners' vocabulary knowledge, there is still a lack of consensus regarding which modalities (textual, visual, auditory), modes (video, picture, text), or language are more effective (Kim, Lee & Lee, 2020). Regarding gloss language, researchers interested in how glosses may enhance vocabulary learning in the EFL classroom conducted several empirical studies to compare the impact of L1 and L2 glosses on incidental vocabulary learning in the EFL classroom, but the results remain inconclusive (Choi, 2016; Han & Niu, 2019; Kang, Kweon & Choi, 2022).

The goal of this systematic literature review, therefore, is to provide a comprehensive synthesis of existing empirical research regarding vocabulary gains from L1 and L2 glosses through reading. To attain this aim, this article reviews how incidental vocabulary is operationalized when L1 and L2 glosses are used, identify the most effective glossing method to enhance EFL learners' incidental vocabulary learning through reading based on the available literature, and highlight reasons why some glosses may be more effective. The findings of this review will have important implications for researchers and educators. The questions below will guide this study:

1. How is incidental vocabulary operationalized in these studies?

2. Do L1 and L2 glosses differ in their effect on incidental vocabulary learning?

2. METHODOLOGY

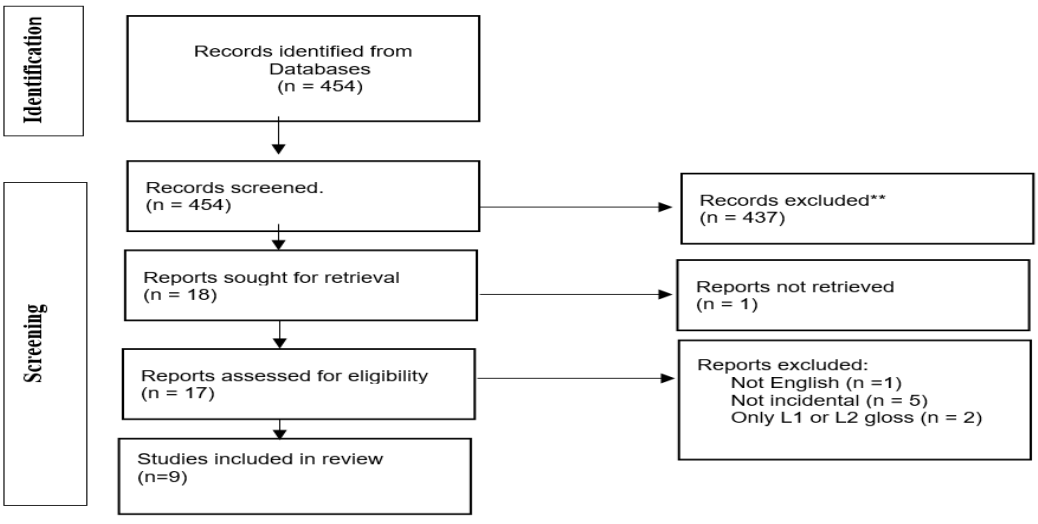
2.1.Identifying Primary Studies

To identify relevant research, the current investigation followed the PRISMA guidelines for Systematic Reviews and Meta-Analysis. known as PRISMA (Liberati et al. 2009). A thorough research for articles published on Scopus that compared the effect of L1 and L1 glosses on EFL learners' incidental vocabulary through reading was performed adhering to the PRISMA approach (Liberati et al. 2009; Moher, 2015). The following command was used to search for related studies: Title-ABS-KEY gloss OR annot* AND l1 AND l2 AND vocabulary AND read* AND (LIMIT-TO (PUBYEAR , 2023) OR LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2015) OR LIMIT-TO (PUBYEAR , 2014)) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "english")). The number of studies retrieved at the first stage was 439 with only one duplicate due to conducting the search only on Scopus. Subsequently, a second research on the same database was conducted using the following command: TITLE-ABS-KEY (L1 AND L2 AND incidental AND gloss OR annotation). The second research came out with 15 studies. In total, the two commands came with 454 studies.

2.2.Inclusion and Exclusion Criteria

To decide on eligible studies for review, the author and two other doctoral students screened the titles and abstracts of the retrieved studies before conducting a comprehensive assessment of the full-text articles.. The remaining studies were analyzed according to the following inclusion criteria. First, the study should be published on Scopus. Second, the study should be published after 2013.This applies to studies that used paper-based glosses as well as those which used computer-mediated ones. Third, the study should deal with ESL/EFL learners. Fourth, the study should investigate the effect of L1 and L2 glosses on ESL/EFL learners' incidental vocabulary. Fifth, the study should adopt either an experimental or a quasi-experimental design. Sixth, the study should administer ensure homogeneity of the groups. Finally, the study should be written in English. After screening 454 titles and abstracts, a total of 17 studies were found to meet the pre-established criteria and serve the aim of the present systematic literature review. The 17 studies then were submitted for full-text analysis. Ultimately, a total of 8 studies were included in this review.

Figure 1. Flowchart for Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).



2.3.Article Selection

The articles selected in the present study are limited to empirical ones. A total of 9 studies that are found suitable for the aims of the study are selected and thoroughly examined. The articles reviewed are all published in peer-reviewed journals. It is also worth highlighting that most of these studies are conducted in Asian countries. The distribution of the articles reviewed in this systematic review based on the publishing journals is summarized in Table 1 below.

Table 1. *Distribution of reviewed articles based on journal.*

Journal	Number of studies	Study
Theory and practice in language studies	1	Gan (2014)
Learning and Individual Differences	1	Choi (2016)
International Journal of Applied Linguistics and English Literature	1	Moradan and Vafaei (2016)
International Journal of Emerging Technologies in Learning	2	Mao and Zhang, Y. (2017); Han and Niu (2019)
ReCALL	1	Hu, Vongpumivitch, Chang, and Liou (2014).
Language Teaching Research	1	Kang, Kweon, and Choi (2022).
Journal of Educational and Social Research	1	Asllani and Paçarizi (2021)
Modern English Education	1	Ko, M. H. (2017)

3. RESULTS

This section presents and analyses the selected articles to answer the aforementioned research questions. The analysis revealed the different ways incidental vocabulary is operationalized, the effect of L1 and L2 glosses on learning vocabulary incidentally in addition to the reasons explaining the effect of the glosses. Table 2 below provides a matrix of the reviewed studies regarding the effect of L1 and L2 glosses on learning vocabulary incidentally among EFL learners.

Table 2. *Matrix of previous studies*

Study	Design & Instrument	Participants	Operationalization	Gloss type & Effect	Explanatory factors
Gan, X. (2014)	**Design:** Quasi-experimental with 3 groups. 367-word long reading text adapted from the *Time* *Readability* measured using Flesch-Kincaid scale.	75 college undergraduates from China	Vocabulary acquisition that occurs as a byproduct of activities that are not explicitly directed towards vocabulary learning.	**Gloss type:** Grp1: no gloss Grp2: Single Grp3: Multiple-choice **Effect:** Multiple choice generated better learning effects on incidental vocabulary than single glosses.	Cognitive load: Control: - need, - search, - evaluation Single gloss group: + need, - search, - evaluation Multiple-gloss group: +need, - search, +evaluation
Choi, S. (2016)	**Design:** Between-group 14-page texts adapted from the short story "Miss Bracegirdle's Night of Fear"	180 male Korean tenth grader students	Acquiring novel words through reading without any instructional intervention apart from glosses	**Gloss type:** Grp 1: No gloss Gp2: L1 marginal gloss Grp3: L2 marginal glosses **Effect:** L1 & L2 groups scored significantly higher than the control group. The difference between L1 & L2 groups was not statistically different except for delayed vocabulary test for *F4 words.	Frequency of input matters when explaining the effect of L1 and L2 glosses. Mapping L1 glosses onto new L2 words may increase retention.
Moradan, A., & Vafaei, M. (2016)	**Design:** experimental design with a between-subjects design. Key English Test containing 20 items was used to guarantee homogeneity. 10 Texts adopted from Oxford Word Skills (2008). Pre-test of targeted vocabularies	45 male and female EFL students aged between 8 and 14 years. They are low-intermediate based on Key English Test	the vocabulary growth that occurs when learners encounter new words in the context of reading or listening to a text.	**Gloss type:** Grp 1: Textual (L1 gloss) Grp 2: Pictorial gloss Grp 3: Textual-pictorial gloss **Effect:** The textual-pictorial gloss group outperformed the other groups.	Dual coding theory: the presence of text and picture caused profound processing of unfamiliar words.

	Teacher-made Post-test containing 30 fill in the blanks questions.				
Mao, L., & Zhang, Y. (2017).	**Design:** Randomized controlled experiment. 728-word article from New College English (2nd edition) Fast Reading (Book 2)	117 second grade non-English majors with the same male/female ratio.	Learning new words through comprehension and coherent grasp of full text because learning vocabulary is not the primary focus of the learner or the main content of the learning material.	**Gloss type**: Grp1: Chinese annotations only Grp2: Chinese and image annotations Gp3: English annotations only Grp4: English and image annotations **Effect:** Textual L1 (Chinese) and L2 (English) glosses. L1 mode is more conductive to learning and memorizing new words.	Students tend to think in their first language.
Han, M., & Niu, S. (2019)	Factorial design (2x6 between-subjects design) Test: pretest; immediate; delayed **Reading text:** Seven Crows I Grimm's Fairy tales	105 non-English major university students. 53 = high level; 52= low level.	Unintentional acquisition of vocabulary through other tasks such as reading, listening, and retelling	**Gloss type:** Group 1= text + picture (18 High + 19 low) Group 2= text + voice (17 high + 18 low) Group 3= text+ picture+ voice (18 high + 15 low) **Effect:** For high levels: text+ picture+ voice outperformed the other groups, followed by text+ voice in immediate and delayed tests. For low levels: text+ voice group outperformed others in immediate test, while text+ voice+ picture group scored higher in the delayed posttest.	Voice gloss is not effective for low level students because it exceeds their hearing ability. In the gap filling exercise, text + voice is more effective for low level learners because it is connected to how words are spelt.
Hu, S. M., Vongpumivitch, V., Chang, J. S., & Liou, H. C. (2014).	**Design:** Repeated measures design Pretest to exclude participants who could not read L2 glosses, and single out target words.	78 Taiwanese high-school students: 38 high-level learners, and 40 low level	Similar to Hulstijn (1996), incidental vocabulary in this study refers to the acquisition of meaning when learners are engaged in tasks such	**Gloss type:** High level: Group one read a text glossed with L1 glossed definition, while group 2 read a text glossed with L2 definition. Then, they switch texts in experiment 2. Low level: Group 1 read a text glossed with L1 definition, while group 2 read a text	The proficiency of the participants determines the effect of L1 and L2 glosses. The higher the level, the more effective the

	Immediate and delayed posttest: Three texts adapted from Hill 1992 & 1994.	learners divide into four groups.	as reading or listening. The learning thus is not deep and affected by time (Nation, 2001; Yoshii, 2006)	glossed with L2 definition. Then, they switch texts in experiment 2. **Effect:** Tukey HSD and Scheffe tests showed that the difference between high level groups were not statistically different (p = .97), and the same for between low levels (p = .61). Both high groups outperformed low-level groups regardless of the language gloss.	gloss regardless of the type of gloss; L1 or L2. There seems to be a threshold for L1 or L2 as a helping option to take effect on incidental vocabulary.
Kang, H., Kweon, S. O., & Choi, S. (2022)	**Text:** a 1685-word story titled "The Lady or The Tiger" featured grade 4 readability level as computed by the Flesch Kincaid test. **Vocabulary tests (post-test:** Recall test: participants recall target words form and meaning. Form-meaning association test: participants provide meaning in Korean or in English. **Comprehension test:** to encourage reading for meaning comprehension.	77 Korean university students with an average age of 23.34 years with advanced reading proficiency according to the Nelson-Denny Reading Test	Incidental vocabulary is a phenomenon through which learners unintentionally acquire new words while participating in activities such as reading or listening.	**Gloss type:** Control: no gloss Group 1: 20 pseudowords glossed with L1 on the bottom margin. Group 2: 20 pseudowords glossed with L2 on the bottom margin. **Effect:** Form recall test: there is no significant difference between the three groups. Form plus meaning recall: experimental groups outperformed the control, but no significance difference between L1 and L1 glosses. Form meaning association test: Gloss groups outperformed the control but no significant difference between L1 and L2 groups.	Analysis of eye tracking data show that there is no significant difference regarding processing of in-text target words. No significant difference between L1 and L2 gloss groups regarding processing of bottom-margin target words, while fixation count revealed a minimal difference. L2 group gazed and fixated longer at their glosses than L1 group. L2 group had longer reading time. **Correlational analysis:** Positive correlation between time spent processing intext glosses meaning recall scores in L2

					group (r = .739, p < .01). Negative nonsignificant association between time spend processing intext glosses and form-meaning associations. L1 glosses provided the correct contextual meaning of unknown words. Learners are prone to learn better when images are present according to Paivio's (1986) imagery system and Mayer (2009).
Asllani, H., & Paçarizi, R. (2021).	Quantitative quasi-experimental design Demographic questionnaire Placement test: to ensure homogeneity. Immediate post-test: word recognition Text: 576-word text	59 fifteen-year-old Albanian students divided into four groups.	Answering reading comprehension questions without drawing learners' focus on learning unknown words.	**Gloss type:** Control: no gloss Experimental Group$_1$: L1 translation Experimental Group$_2$: L2 definitions + audio Experimental Group$_3$: L2 definition + image **Effect:** Group$_3$ scored greater followed by group$_1$.	L2 proficiency determines the type of gloss to use. Eckardt and Feldman (1984) three models explain higher- level learners' performance as being between intermediate and concept mediation model.
Ko, M. H. (2017)	Experimental: between-subject design **Instruments:**	329 high-intermediate undergraduate and graduate	Byproduct of another activity	**Gloss type:** G1= no gloss	Lower-level learners did not benefit from L2 glosses because they are in the word

	Cloze test: Watanabe (1997) Reading text: passage from *The Multicultural Workshop* (Blanton & Lee, 1995) which belong 8th grade level according to Flesch-Kincaid readability scale. Immediate and delayed vocabulary posttest: MCQ. Opinion survey	students in Korea		G2= L1 gloss G2= L2 gloss G3= L1+L2 gloss **Effect:** Glosses have positive effect on vocabulary learning in immediate and delayed tests. **Immediate test:** High-levels learners: L1+L2 glosses are effective. Low level learners: Both L1 and L1+L2 are effective with a tiny difference. **Delayed test**: High level learners: L2 group achieved highest followed by L1+L2 group. Low level learners: L1 groups achieved the highest followed by L1+L2 group.	association model stage. Conditions that showed no significance decline in word knowledge rate may be due to vocabulary pre-knowledge or ineffective gloss type.

Table 2 above offers a concise overview of the studies analyzed in this review. The table includes information on the study design, instruments used, participant demographics, approaches to incidental vocabulary learning, types of glosses employed in each study, and the impact of glosses on incidental vocabulary acquisition. Additionally, the table explores the factors that contribute to the observed gloss effects. Subsequently, the results are presented in more details.

3.1 The Operationalization of Incidental Vocabulary Learning

The reviewed studies provided almost identical operationalizations of incidental vocabulary learning. Gan (2014) operationalized incidental vocabulary learning as being a byproduct of reading. To ensure that learners do not primarily focus on vocabulary learning, the learners in this study were asked to recall the text they had read in their mother tongue. In other words, the researcher directed learners' attention towards another task other than vocabulary and they were not told that they would be tested on the 8 glossed words. In the same regard, Hu et al. (2014) operationalized incidental vocabulary learning

as the acquisition of vocabulary when learners are engaged in other tasks such as reading or listening. Similar to Nation (2001) and Yoshii (2006), they believe that this type of learning results in shallow and fragile gains.

Choi (2016) believed incidental vocabulary takes place when learners focus on comprehension and meaning. Choi tested the participants' incidental vocabulary gains of the target vocabulary through a surprise text. Mao and Zhang (2017) added that besides the importance of learners' focus on comprehension, vocabulary learning should not the main aim of the learner or the main content of the learning material. Other studies supported the previous views on incidental vocabulary learning arguing that L2 learners can learn a huge number or words incidentally from extensive reading (Asllani & Paçarizi, 2021; Han & Niu, 2019; Kang et al., 2022; Ko, 2017).

Although incidental vocabulary may be open to different interpretations, it is evident from the table above that all the studies included in this review share the view that incidental vocabulary takes place when learners are involved in other activities other than vocabulary learning. These studies show that there are basically two approaches to ensure incidental vocabulary learning. First, learners' attention should be directed towards other tasks other than vocabulary learning. Second, the participants should not be forewarned about any subsequent vocabulary test which will decrease attention given to vocabulary.

3.2 The Effect of L1 and L2 Glosses

Research on the effectiveness of textual glosses in second language learning has been conducted in various contexts. In a quasi-experimental study, Gan (2014) found that single and multiple-choice glosses were more effective than no glosses in aiding vocabulary acquisition for Chinese college undergraduates. Moreover, the multiple-choice glosses outperformed the single gloss condition. Similar results were obtained by Choi (2016) in a study with Korean tenth grade learners, where L1 and L2 marginal glosses were found to be more effective than no glosses. No significant difference was found between the two types of glosses except for when the glossed word was encountered four times. In the latter case, the L1 group scored higher than the L2 group in the delayed test.

Moradan and Vafaei (2016) conducted an experiment with 45 Iranian students aged between 8 and 14 years. The results showed that L1 textual glosses enhanced with visuals were more effective than L1 textual glosses alone or pictorial glosses alone. In another study, Mao and Zhang (2017) found that L1 and L2 glosses were more effective than English annotations and Chinese plus image annotations in aiding vocabulary acquisition for second-grade non-English majors. However, L1 glosses were found to be more effective than L2 glosses.

Han and Niu (2019) investigated the effectiveness of different types of glosses on high and low-level non-English major university students. The results showed that the text plus picture plus voice combination was more effective for high-level participants, while the text plus voice combination was more effective for low-level participants in the immediate test. However, the text plus voice plus picture combination scored significantly higher in the delayed posttest for low-level participants.

Hu et al. (2014) conducted a study with Taiwanese high-school students and found that both L1 and L2 textual glosses were effective in aiding vocabulary acquisition for both high and low-level learners. However, high-level learners outperformed low-level learners regardless of the language used. Kang et al. (2022) found that there was no significant difference between L1 and L2 glosses in aiding vocabulary acquisition for advanced Korean university students.

Asllani and Paçarizi (2021) conducted a study with Albanian students and found that L2 definitions with images were more effective in aiding vocabulary acquisition than L1 translations or L2 definitions with audio. Finally, Ko (2017) found that both L1 and L2 glosses were effective in aiding vocabulary acquisition for high-intermediate undergraduate and graduate students in Korea. However, the combination of both glosses was more effective for high-level learners in the immediate test, while L2 glosses were more effective in the delayed test. For low-level learners, L1 glosses were always the most effective, followed by the combination of L1 and L2 glosses.

3.3 Factors Explaining the Effect of L1 and L2 Glosses.

The present systematic review was carried out mainly to investigate the effect of L1 and L2 glosses on incidental vocabulary learning. The results from the reviewed studies show that there is not a consensus regarding the most effective type of gloss and why. In other words, some studies found that L1 glosses are more effective regarding incidental vocabulary learning, while others found that L2 glosses are more effective. This subsection seeks to highlight factors that explain these results.

Gan (2014) explained the superiority of multiple-choice glosses from the point view of cognitive psychology and the involvement load hypothesis. She explained that three factors determine the effect of glosses. These are need, search an evaluation. In her study, the multiple-choice condition was found to be + need, - search, + evaluation which provided deeper involvement and processing of the glossed words. In other words, the multiple choice generated a load index of 2, while the single gloss and the no gloss generated indexes of 1 and 0 respectively. In the same vein, Moradan and Vafaei (2016) explained that the provision of text with picture deepens the processing of unfamiliar words and increases the involvement load which results in better results. Similarly, Asllani and Paçarizi (2021) explained that glosses yield better results when images are present. They argued that this is theoretically supported by Paivio's (1991) imagery system and Mayer's (2009) Cognitive Theory of Multimedia Learning. On the other hand, Han and Niu (2019) explained that when combining textual glosses with picture or voice the participants' level and test type should be considered.

Choi (2016) argued that frequency of input should be considered when interpreting results from gloss studies. He explained that providing L1 glosses helps learners to create direct association between the L2 form and L1 meaning. In other words, learners link L2 form to their equivalents in their L1 rather than to the L2 meaning. Similarly, Mao and Zhang (2017) explained that L1 effectiveness in their studies can be attributed to the participants' thinking in their first language.

Another explanatory factors for the results in the reviewed studies is the participants' proficiency. Hu et al. (2014) explained that the higher the level of the participants the higher the vocabulary gains whether in L1 or L2 gloss conditions. They added that there is a threshold where L1 or L2 glosses can be more effective. Ko (2017) support the same view. He explained that Potter, Eckardt and Feldman's (1984) three models should be considered when designing glosses for learners.

4. DISCUSSION

Incidental vocabulary is operationalized differently in the literature. For instance, Nation (1990) linked incidental vocabulary to learners' attention. He explained that incidental vocabulary takes place when learners' attention is focused on the message conveyed, but they may also pay peripheral attention to the form of the words. Laufer and Hulstijn (2001) on the other hand linked incidental vocabulary learning to the absence of notification on the task. In other words, the learners might engage in a task that requires them to process information, but they will not be notified beforehand that their memory of the information will be tested. In the studies reviewed in this systematic review, all the studies administered vocabulary tests for which students had no prior knowledge and are asked to do comprehension tasks.

Boers (2022) argued that the absence of notification is now considered as a direct way to distinguish between intentional and incidental vocabulary learning. It is however undeniable that glossing words brings some attention to the glossed words. In this regard, Webb (2020) illustrated that we tend to pause and think about unknown words when encountered. This is empirically supported by Kang et al. (2022) who showed that the participants have longer eye fixation on the glossed words. Although it is not possible to eliminate some intention and attention to vocabulary in reading glossed texts, the discussion is merely academic and aims at finding the best ways to enhance learners' vocabulary gains from reading (Boers, 2022; Webb, 2020).

The results from the reviewed articles seem to add more fuel to the debate about the debate about the use of L1 and L2 in the EFL classroom and the effectiveness of L1 and L2 glosses in specific. For instance, Asllani and Paçarizi (2021), Choi (2016) and Mao and Zhang (2017) found that L1 glosses are more beneficial than L2 among low level learners. These findings find support in the Kroll and Stewart's (1994) revised hierarchical model which suggests that learners at low proficiency levels tend to depend more on their L1 when processing L2. Potter et al. (1984) illustrated that learners at the word association model and the intermediate model tend to resort to their L1 in order to process L2 word though with varying degrees.

Similarly, Hu et al. (2014) and (Ko, 2017) showed that the language proficiency of the participants counts when measuring the effect of glosses on incidental vocabulary learning regardless of the gloss type. In other words, findings from the two studies posited that glosses always yield better results with advanced learners which in turn lends credit to three models of processing L2 words based on language proficiency put forward by Potter et al.

(1984). Ko (2017) explained that high-level learners in his study enter the concept mediation stage which made L2 glosses more rewarding because they could operate the L2 glosses without linking them to their L1 equivalents.

5. Research Implications

It is noticeable that most of the studies reviewed in this systematic literature review focused on Asian participants. The results yield inconclusive results due to the different research designs, participants proficiency and gloss type. Future research may consider conducting more studies with participants with different mother tongues. Also, it may be interesting to investigate the effect of the same L1 and L2 glosses with participants at different proficiency levels. Finally, though research provide evidence for the importance of repeated encounters with the glossed words, it is not yet clear in which encounter the gloss may be more effective. Hence, the issue needs more attention.

6. Conclusions

This review analyzed several studies that investigated the effectiveness of L1 and L2 glosses on incidental vocabulary learning. The studies reviewed generally agree that incidental vocabulary learning occurs when learners engage in tasks other than vocabulary learning, and that glosses can be effective in aiding vocabulary acquisition. However, there are varying results regarding the effectiveness of L1 and L2 glosses, with some studies indicating that L1 glosses are more effective (Choi, 2016; Mao & Zhang, 2017), while others suggest that L2 glosses are equally or more effective (Asllani & Paçarizi, 2021; ko, 2017). Furthermore, the studies suggest that factors such as learner proficiency can influence the effectiveness of glosses in vocabulary acquisition. Overall, this review underscores the importance of carefully considering the factors that contribute to successful incidental vocabulary learning when designing L1 and L2 glosses.

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