

## **Assessing the Effects of Mediated Glosses on Vocabulary Retention and Comprehension with L2 Learners of English Language in Higher Institutions.**

**Dahiru Musa Abdullahi**

English Language Programme, School Of General Studies, Abubakar Tatari Ali Polytechnic, Bauchi, Bauchi State

### ***Abstract***

This study tries to investigate the Effectiveness of Mediated Glosses for Vocabulary Development in term of Understanding and Retention. Previous Research has found that on line glosses improve information access Comprehension, Vocabulary Retention and Efficiency with the Second Learner of English Language. Participants were drawn from different schools within the Polytechnic, as L2 learners of vocabulary items via Mediated Glosses generated higher effects possible explanation of the finding were discussed extensively. The study reveals evidence on the affordances provide by call in vocabulary recognition and productions among L2 learners. It also suggests process that could enhance teaching and motivate learning in the ESL classroom.

**Keywords:** Mediated glosses, Vocabulary gain, Computer Assisted Language Learning (CALL), Second Language Learner L2, Synchronous, Asynchronous

### **Introduction**

Almost all second language (L2) learners and teachers are well aware of the fact that learning an L2 involves acquiring a large number of words. Experts and researchers in second and foreign language acquisition have increasingly

emphasized the importance of investing in vocabulary learning. Research has shown that there is a strong relationship between vocabulary knowledge and reading comprehension (Laufer, 1997; Adams, 2000). Almost all second

language (2) learners and teachers are well aware of the fact that learning an L2 involves acquiring a large number of words. According to Gardner (2011), L2 learners' most important goal is to work for communicating effectively in the target language. Without a good command of L2 lexical knowledge they may face communication breakdown.

Being a survey approach the research purposively sampled a random base of the ND1 population of the Federal Polytechnic Bauchi and Abubakar Tatari Ali Polytechnic Bauchi by observing students Composition writings, test, Examination and Assignment were observed by the researcher however primary data were collected for the purpose of analysis from result that could be generalized from the sample to the population. Secondary data were obtained from different social media handles. Participants caption and replies were noted to compare the activity of the social media and that of student's academic writings. The findings are that CAI had a positive effect on vocabulary recognition and production among adult L2 learners; however, an interaction was found between the proficiency level and the type of vocabulary tests. The differences in pretest and post-test means reveal that while both high and low proficiency groups showed almost similar degree of production gains, low proficiency participants revealed higher recognition gains, that The outperformance of the experimental group compared with the control group documents the beneficial effect of CAI on L2 vocabulary development, which has been corroborated in some studies (e.g. Suet al, 2019; Tsai, in press; Wang, 2014) also that The high recognition gains observed in the lower level participants concur with the findings of some studies (e.g. Chen, et al, 2019; Li, 2010; Yun,2011) which claimed that the online vocabulary enhancement tools including the computer-mediated dictionaries and particularly bilingual dictionaries conform to low-abiding learners' learning styles and preferences. Vocabulary recognition gains differed across varied proficiency levels, however, a similar trend was not observable for production gains. While both high and low groups outperformed their vocabulary production pretest scores, not a significant difference was found between the two groups in their vocabulary production gains.

## **BACKGROUND**

Researchers argue that, in order to develop linguistic abilities, 1.2 readers need to reach a certain vocabulary threshold (Geva& Clifton, 1994; Brisbois, 1995; Kim, 1995; Lomicka,1998). Research has shown that there is a strong relationship between vocabulary knowledge and reading comprehension (Laufer, 1997; Adams, 2000). Stahl (1983) describes the relationship between vocabulary knowledge and reading comprehensions as "one of the best documented relationship in reading research" (p.33). Adams (2000) investigated the relationship between reading comprehension, vocabulary knowledge, and fluency. This found that vocabulary knowledge was

important for both reading comprehension and fluency. There are two main types in the process of vocabulary learning: intentional and incidental (Huckin&Coady, 1999; Laufer &Hulstijn; 2001). In intentional vocabulary learning, learners enhance their vocabulary knowledge through conscious cognitive processing such as repetition, mnemonics and rehearsal. However, new words are added to learners' vocabulary with the help of reading a passage or listening to a speech in incidental vocabulary learning. Gloss is one of the strategies which facilitate vocabulary learning and reading comprehension. Nation (1983) defines gloss as a short definition. Nagata (1999) states four functions of gloss on vocabulary learning. First, marginal glosses are easier to use in contrast to dictionaries. Second, glosses include the notion of "consciousness-raising" and "input enhancement". Third, they support the "meaning- form connection" approach by relating words to meaning. Fourth, learners are encouraged to do lexical processing.

Moreover, Ko (2005) summarizes four advantages of glossing. Firstly gloss helps readers to understand new words precisely. Secondly there is no need for L2 readers to look up the new words persistently, thirdly readers relate prior knowledge to new knowledge with the help of gloss and lastly gloss gives readers greater autonomy. Some studies have been done in order to investigate the effect of gloss on reading comprehension as well as vocabulary learning. Johnson (1982) investigated vocabulary retention under four different conditions on reading comprehension. The four conditions were no help with vocabulary, reading the definitions of new words before reading, reading a passage with the new words in glossed form, and reading the new words before reading and reading the text with glosses. Seventy-two ESL university students participated in the study. All the students took part in a close test, recalling the story in their L2 and recognizing exact sentence from the passage after reading. The results revealed that different types of vocabulary conditions did not significantly affect the comprehension. However, background knowledge of reading facilitated reading comprehension.

This association between vocabulary knowledge and reading comprehension has led many 12 researchers to say that "a reader's general vocabulary knowledge is the best predictor of how well that reader can understand text" (Anderson & Freebody, 1981, p.3). Stahl (2003) also states that vocabulary knowledge has been the "foremost predictor of a text's difficulty" (p.241).

As stated above, many researchers such as Knight (1994), Laufer (1997), and Yoshi and Flaitz (2000) consider vocabulary learning as an important part of each L2 learner's life. Other researchers such as Harley (1996), Groot (2000), and Ghabanchi and Anbarestani (2008) accept the importance of vocabulary learning in language proficiency and academic achievement; however, their ideas about how vocabulary is

learned vary widely. They argue that one of the major concerns in L2 vocabulary learning is the need to develop effective pedagogical methods for teaching L2 vocabulary. They believe that traditional pedagogical methods (word-lists, dictionary use, workbooks, teacher-materials, and marginal glosses embedded in language textbooks are no longer effective for teaching L2 vocabulary. Therefore, L2 learners need to develop strategies for coping with difficult words (Harley, 1996).

Some of the traditional pedagogical methods include the use of dictionaries and marginal glasses embedded in certain language textbooks (Harley, 1996; Groot, 2000; Ben Salem 2006; Ghabanchi&Anbarestani, 2008). These two instructional methods are not convenient for L2 learners who, in order to use the resources, have to interrupt their reading process and lose sight of the text while looking for the meanings of difficult words (Ben Salem 2006). The use of dictionaries can make reading a text in L2 learning a "three to four-hour ordeal" (Crow, 1986, p.242). In order to efficiently use a dictionary, L2 learners need special training because encountering several meanings for a single word can be difficult (Nation, 2001) and confusing (Luppescu& Day, 1993).

Despite the recognized importance of vocabulary learning, this essential component of language learning still causes headaches for L2 learners. They tend to forget newly learned words quickly and they have difficulty using them in either speaking or writing because of a lack of knowledge of pragmatics. However, the appearance of Computer-Assisted Language Learning (CALL) has provided a new means for learning vocabulary. With computers and the internet becoming more and more popular, many CALL programme and online materials have flooded the area of language teaching and learning. These CALL programmes provide L2 learners with a variety, of learning activities, which MK were only a dream decades ago (Jing-hua, 2009). The development of CALL had three phases; (a) behaviourist CALL, (b) communicative CALL, and integrative CALL. Each phase is marked by distinct theories of language learning and teaching (Warschauer 1996a).

## **REVIEW OF RELATED LITERATURE**

Many scholars consider vocabulary acquisition to be the single most important aspect of second language learning [1]. In order to develop linguistic abilities second language (L2) learners need to reach a certain level of vocabulary threshold [1, 2, 3, 4, 5, 6]. Research has shown that reading comprehension is closely connected to vocabulary knowledge [7, 8] and fundamental to reading comprehension. Readers cannot understand text without knowing what most words mean [9].

With advances in computer networking and media technologies, computerized glasses have emerged over the past 15 years as efficient resources for improving vocabulary acquisitions and reading comprehension.

Researchers are now investigating how different media features incorporating text, still pictures and video influence incidental vocabulary acquisition [11, 12, 13, 14, 15] and reading comprehension [15, 16, 17, 18,19]. This area of research, especially with foreign language learners, is at the beginning stage [20]. In fact, there is a need to investigate incidental vocabulary learning from reading tasks involving multimedia [21, 16, 22, 11,23].

As stated above, many researchers such as Knight (1994), Laufer (1997), and Yoshii and Flaitz (2000) consider vocabulary learning an important part of each L2 learner's life. Other researchers such as Harley (1996), Groot (2000), and Ghabanchi and Anbarestani (2008) accept the importance of vocabulary learning in language proficiency and academic achievement; however, their ideas about how vocabulary is learned vary widely. They argue that one of the major concerns in L2 vocabulary learning is the need to develop effective pedagogical methods for teaching L2 vocabulary. They believe that traditional pedagogical methods (word-lists, dictionary use, workbooks, teacher-materials, and marginal glosses embedded in language textbooks) are no longer effective for teaching L2 vocabulary. Therefore, L2 learners need to develop strategies for coping with difficult words (Harley, 1996).

Some of the traditional pedagogical methods include the use of dictionaries and marginal glosses embedded in certain language textbooks (Harley, 1996; Groot, 2000; Ben Salem 2006; Ghabanchi&Anbarestani, 2008). These two instructional methods are not convenient for L2 learners who, in order to use the resources, have to interrupt their reading process and lose sight of the text while looking for the meanings of difficult words (Ben Salem 2006). The use of dictionaries can make reading a text in L2 learning a "three to four-hour ordeal" (Crow, 1986, p.242). In order to efficiently use a dictionary, L2 learners need special training because encountering several meanings for a single word can be difficult (Nation, 2001) and confusing (Luppescu& Day, 1993).

Despite the recognized importance of vocabulary learning, this essential component of language learning still causes headaches for L2 learners. They tend to forget newly learned words quickly and they have difficulty using them in either speaking or writing because of a lack of knowledge of pragmatics. However, the appearance of Computer-Assisted Language Learning (CALL) has provided a new means for learning vocabulary. With computers and the internet becoming more and more popular, many CALL programme and online materials have flooded the area of language teaching and learning. These CALL programmes provide L2 learners with a variety of learning activities, which were only a dream decades ago (Jing-hua, 2009). The development of CALL had three phases; (a) behaviourist CALL, (b) communicative CALL, and (c) integrative CALL. Each phase is marked by distinct theories of language learning and teaching (Warschauer 1996a).

This research has been productive, yet it is not conclusive in terms of which media features and gloss design are most effective in advancing reading comprehension and word retention. This study investigated the influence of glosses with different features (text, audio, and pictures) on word retention and reading compensation among second language (L2) Spanish Learners.

### **GLOSSES AND SECOND LANGUAGE VOCABULARY ACQUISITION**

Chun and Plass [16] studied 160 second-semester German Language learners in three American universities. They investigated the effect of media annotations on incidental vocabulary learning. The researchers designed a programme called CyberBuch, where students read a 762-word story with 82 glossed words under three conditions: 1st condition (text definition); 2nd condition (picture gloss); 3rd condition (video gloss). Results showed that students in picture gloss condition recalled the most vocabulary. In a similar study, Al-Seghayer 1231 examined the effects of still picture and video glosses among ESL students at an American university. Students were in one of three conditions: condition 1 (text definitions & audio pronunciation), 2nd condition (text definition + picture), 31 (text definition + video). Results showed that students in condition 2 (Lexi + picture) and condition 3 (text + video) remembered more words on a delayed post-test.

Yoshii, M. & Flaitz, J. [15] investigated incidental vocabulary learning using text and picture glosses with 151 beginning and intermediate ESL adult learners. Students read a story with 14 glossed words presented in three conditions: condition 1 (text definition only); condition 2 (picture only); condition 3 (text definition + picture). Results showed that students in condition 3 (text + picture) understood more vocabulary than students in the text or picture only conditions.

Yeh and Wang [14] investigated the effect of three gloss types on vocabulary learning with 82 ESL learners at a Taiwanese university. Students were in one of three conditions: condition I (text translation + definition)

Chinese translation and English explanations; condition 2 (translation + definition + pictures); condition 3 (translation + definition + picture + audio).

Results found that gloss condition 2 (text translation + definition + picture) was most effective for vocabulary acquisition.

The previously discussed studies have shown that conventional glosses are effective in promoting vocabulary acquisition and reading comprehension in language learning. When computerized glosses are available as hypertext L2 translations or simple definition in the reader's native Language (LI), they combining multiple forms of media such as text, sound, pictures, animated pictures, and video can aid vocabulary

learning and facilitate reading Lomicka, 1998; Davis, 1998). Comprehension (Chun & Plass, 1996a, 1996b, 1997; Al-Seghayer, 2001; Lomicka, 1998; Davis, 1998).

Chun and Plass (1996a, 1996b, 1997) investigated the impact of two combinations of gloss components (text-picture gloss and text-video gloss) on vocabulary learning among English-speaking learners enrolled in a second-semester German course. Results showed that words glossed with both text and picture helped participants recall more vocabulary than words glossed with text and video. In a study similar to the work of Chun and Plass (1996a, 1996b, 1997), Al-Seghayer (2001) examined the impact of dynamic video glosses versus still-picture glosses among EL students at an American University. Participants were assigned to one of three different conditions: (a) text and audio, (b) text and picture, or (c) text and video. Results showed that words that were glossed with text and picture and those with text and video were learned better than words with text-only glosses. However, words with text and video glosses were remembered better than words with text and picture. These results were the opposite of those obtained by Chun and Plass (1996a, 1996b, 1997), whose results showed that text and picture were more effective for recalling words than text and video glosses.

Lomicka (1998) studied the effectiveness of glosses on L2 reading comprehension by investigating whether glossed words facilitated or hindered reading comprehension among students, enrolled in a second-semester French course. Participants were assigned to one of three different to different conditions: (a) text and audio, (b) text and picture, or (c) text and video. Results showed that words that were glossed with text and picture and those with text and video were learned better than words with text-only glosses. However, words with text and video glosses were remembered better than words with text and picture. These results were the opposite of those obtained by Chun and Plass (1996a, 1996b, 1997), whose results showed that text and picture were more effective for recalling words than text and video glosses.

Findings concerning the value of media enhancements to computerized glosses are less conclusive. While learners report that they like mediated glosses, the evidence for the vale of different media features in promoting vocabulary acquisition is still in question. Studies have indicated that the addition of pictures to glosses may improve vocabulary acquisitions.

Research showing the benefits of gloss media enhancements on reading comprehension is less conclusive. The following research questions were specifically addressed:

- Is there any significant effect for learner of L2 with background skills on mediated gloss on vocabulary recognition?
- Is there any significant effect for vocabulary production?

- Does the effect of differ across learners at different proficiency levels of vocabulary and reading comprehension and retention?

## **COMPUTER ASSISTED LANGUAGE LEARNING (CALL) & VOCABULARY ACQUISITION**

In L2 vocabulary acquisition, computer-mediated annotations or glosses can be employed to clarify the meaning of unknown words. They have the potentiality of assisting learners in an adaptive, autonomous, and individualized context. These annotations might be L1 translations, L2 synonyms, definitions, exemplifications, visuals, or a combination of them. There is ample evidence that the use of hypertext glosses affects the reading skill and vocabulary gains in a variety of ways. According to Abuseileek (2008), the incorporation of CALL per se does not explain the overall vocabulary acquisition, but it does so via increasing the retention time and decreasing the vocabulary look-up time. Some other studies (e.g. Su, Li, Liang, & Tsai, in Press; Wang, 2016) also attributed the beneficial effects of CALL to learners' positive attitudes perceptions, and motivation towards reading enhanced by hypertexts.

In pedagogical contexts informed by CALL technology, learners may be engaged in an online synchronous (e.g. video conferencing and chatting) or offline asynchronous (e.g email and blog) CALL. As stated by Abrams (2003), synchronous and asynchronous CALL are similar and different in a number of ways. Both of them offer affordances in terms of more opportunities for langue use, increased amounts of input and output, and more interaction and negotiation. Synchronous mode is simultaneous and requires immediate response and feedback, not allowing for external support. Asynchronous forum, on the other hand, is not subject to time constraints, and learners are able to learn the language at their own pace without being interrupted by the factors inherent in traditional face-to-face modes. Due to the affordance provided in asynchronous mode in terms of reflection of one's ideas, it results in the production of more sophisticated lexicon and syntactically more complex language (Zapata & Sagarra, 2007). According to Fitzpatrick and Donnelly (2010), decisions on whether to adopt a synchronous/asynchronous approach are contingent upon a number of factors including individual dimensions, preferences, aims, purposes, and institutional and pedagogical objectives.

The interface between synchronous/asynchronous CALL and L2 vocabulary acquisition has been examined in a number of studies, providing evidence on the preference of CALL over traditional approaches. In a meta-analysis, Chiu (2013) found an overall average effect of CALL on L2 vocabulary development. She enumerated four important moderators of vocabulary learning in CALL: treatment duration, participants' educational level, game-based learning, and the instruction of the teacher. Learners who received CALL treatment over a short period of time (about

a month) benefited from this type of instruction more than those who were exposed to similar instruction in the long run. Moreover, CALL proved more effective for students at high educational levels (e.g. university level) compared with elementary levels. Instruction via CALL without the fames appeared to be better than game-based instruction. Finally, autonomous student-centered learning led to better outcomes than teacher-directed instruction. Similar observations in term of the advantages of CALL were also reported by Wang (2016), Mirzaei, Rahimi Domakani and Rahimi (2016), and Tsai (in press).

A number of CALL-focused studies have found that learners' vocabulary retention may vary as a function of their proficiency level, amongst other factors. The corresponding vocabulary growth was found to be dissimilar for low and high proficiency learners. Some studies offered evidence on better vocabulary gains in advanced learners (e.g. Abraham, 2008; Gorgian et al., 2011). Abraham (2008), in synthesizing the findings of previous studies on the impact of glosses on reading comprehension and incidental vocabulary acquisition, found a small effect size for beginners compared with intermediate and advanced learners. She, however, argued that since the number of studies was limited for each of the instructional levels, these conclusions were tentative. In a further study, Gorjian and his colleagues (2011) found that low achievers benefited from CALL in vocabulary retention (as shown by their immediate post-test scores), but high achievers demonstrated gains in both vocabulary retention and recall (as shown by their delayed post-test scores).

The better gains of the advanced learners were not reported in all studies, with some research documenting better scores of low proficiency learners (e.g. Chen et al., 2019; Li, 2010; Yun, 2011). Li (2010) explored the short-term and long-term effects of using computer-mediated dictionaries and Chinese English as a Second Language (ESL) students' retention of vocabulary items across different proficiency levels. During the treatment, the participants were required to read stories in two conditions: with and without the support of monolingual print dictionaries and/or bilingual electronic dictionaries. This was followed by some vocabulary tests based on the reading texts. The results showed that low-ability learners outperformed their high-level counterparts. Similar findings were reported by Yun (2011), who conducted a meta-analysis to synthesize the findings of some previous studies that compared the effect of computer-mediated glasses on L2 reading and vocabulary retention among learners exposed to these glosses versus those who used traditional techniques. He found the positive impact of computer-mediated glosses on these measures. In particular, it appeared that, in comparison with intermediate the higher-level learners, lower-level learners were more likely to get advantage from multiple multimedia glosses. This concurs with the findings of Chen (2019), who developed a corpus-based paraphrasing system, assisting learners to expand the knowledge of form, meaning, and the use of lexical items and found the better improvement of the weaker students.

## METHOD OF DATA COLLECTION

The researcher collected the needed data through observing the scripts of all students from three schools which are School of Engineering Department of Civil Engineering,

School of Management Department public Administration and School of Environmental Department of Architecture, School of General Studies Department of Mass Communication and School of Science Laboratory Technology Department of Science Laboratory Technology of both Federal Polytechnic Bauchi and Abubakar Tatari Ali Polytechnic Bauchi. Observation was carried out by the researcher and research assistants in other Schools Departments were also urged to identify at the course of marking if seen those elements of text speak of the social media used in academic writing to ensure that each School and department is represented, a total of 4018 scripts were investigated.

## **RESEARCH INSTRUMENT**

The research instrument used by the researcher to gather the data was observation. The researcher observed the test, examination and assignment scripts of the students. The researcher tends to outline those elements of text speak used by students into academic writings and where such elements sighted the researcher then note them for analysis.

## **DISCUSSION**

This study aimed to investigate the effect of asynchronous CAI on vocabulary uptake among adult L2 learners and to explore whether the vocabulary gains different across learners at high and low proficiency levels. It was found that CAI had a positive effect on vocabulary recognition and production among adult L2 learners; however, an interaction was found between the proficiency level and the type of vocabulary tests. The differences in pretest and post-test means reveal that while both high and low proficiency groups showed almost similar degree of production gains, low proficiency participants revealed higher recognition gains. Finally, the effect of CAI was found to be durable over four weeks.

The outperformance of the experimental group compared with the control group documents the beneficial effect of CAI on L2 vocabulary development, which has been corroborated in some studies (e.g. Suet al, 2019; Tsai, in press; Wang, 2014). These studies argued that online vocabulary tools provide opportunities for vocabulary practice and enrichment, an affordance nonexistent in traditional approaches to vocabulary instruction. Boers, Warren, Grimshaw, and Slyanova-Chanturia (2017) argued that using different forms of glosses afforded by online tools bring about learners' mental engagement with the target word and hence promotes the acquisition of different aspects of the word. This finding is also consistent with the SCT in that the technological tools provide affordances for learning and regulate the learning process, providing mediated assistance to learners and help them move from object-regulation towards autonomous functioning or self-regulation.

The high recognition gains observed in the lower level participants concur with the findings of some studies (e.g. Chen, et al, 2019; Li, 2010; Yun,2011) which claimed that the online vocabulary enhancement tools including the computer-mediated dictionaries and particularly bilingual dictionaries conform to low-abiding learners' learning styles and preferences. Zapata and Sagarra (2007) argued that while processing the unknown words, low ability learners experience greater difficulty and

high cognitive load and are likely to avoid allocating much time and mental operations to process these words. The provision of computer-mediated aids helps "enhancing cognitive resources and lead(s) learners to engage to deeper processing when needed" (p. 168).

The improvement of the weak learners, however, contradicts the results of some studies (e.g. Abraham, 2008; Gorjian, et al, 2011) that reported higher performance gains by advanced learners and attributed this to the dual code theory (Paivio, 1991). According to this theory, two mental systems or codes, including verbal and non-verbal, account for the knowledge of language and knowledge of the world. When applied to L2 vocabulary acquisition, by using multiple (auditory and visual) glosses of retrieving new vocabulary, knowledge of the lexica item is established as a result of the simultaneous engagement of auditory and visual memories. However, not a variety of hypertext glosses were used in this study, with the major gloss being the textual one. Although the pronunciation module has been incorporated in the progress as well, it assisted the participants' mastery of phonological form rather than meaning and did not contribute to learners' test performances.

Vocabulary recognition gains differed across varied proficiency levels, however, a similar trend was not observable for production gains. While both high and low groups outperformed their vocabulary production pretest scores, not a significant difference was found between the two groups in their vocabulary production gains. Moreover, as revealed by their delayed post-test scores, both groups were found to retain the vocabulary gains after four weeks.

It can be concluded that both groups not only used the textual glosses to make sense of the general meaning of the text, but also retained the lexical associations and cues for future use. This corroborates the findings of some previous studies (e.g., Li, 2010; Rimrott, 2010) that documented the long-lasting effect of CALL on vocabulary acquisition.

**Conclusion, Limitations and Suggestions for Future Studies** The limitations of this study should be acknowledged. As a vowel experience, exposure to CAI in the beginning sessions entailed some degree of resistance on the part of the students with a lesser degree of ambiguity tolerance. This was, however, alleviated gradually, and despite an awkward commencement, the students were comfortable with the technology in later sessions. A further limitation relates to employing a small population and single type of gloss, i.e., textual. Future research may address the implementation of CALL with a bigger sample size, a variety of annotation types, using more rigid measures, and over a prolonged period of time to provide a detailed account of how the incorporation of CALL technology alone or as an extracurricular programme affects the development of different aspects of L2 in general and 12 vocabulary skill in particular.

This study contributes to CALL research by providing evidence on the affordances offered by CAI in vocabulary recognition and production amongL2 learners at high and low proficiency levels in both the short and the long run.

Some pedagogical implications may be drawn. Teachers, L2 practitioners, and material designers are suggested to incorporate the technology in the design of the

curricula as an aiding tool in conventional face-to-face instructional contexts. The overall better improvement of the low-level group suggests that CAI may be potentially more effective for weaker students, provided that the affordance of this technology are appropriately tailored to the proficiency level of the students (Cakmak&ErCetin, 2018). Various features of the CAI interface may be customized to cater for the needs of a variety of students with different educational goals and objectives.

While implementing CAI, it should be noted that technology does not necessarily guarantee success. The educational system's online infrastructures, the stakeholders' computer literacy, the properties of the programme, and learners' attribute including their learning styles and preferences (verbalizer or visualizer) are the factors in need of consideration in adopting/adapting the CAI. moreover, it should be born in mind that, as suggested by Kowie and Sakui (2013), employing computer technology in language learning should not be a replacement for the whole learning/teaching practices and processes, but rather it can be a complement facilitating these practices. Considering the mixed findings in terms of the benefits of mediated glosses to learners at high/low proficiency levels, this domain opts for more studies to arrive at robust finding and generalize results.

## REFERENCES

- Abraham, B. (2008). Computer-Mediated Glosses in Second Language Reading Comprehension and Vocabulary Learning: A Meta-Analysis. *Computer Assisted Language Learning*, 21(3), 199-226.
- Analysis of Empirical Research. *Computer Assisted Language Learn* 31(8), 882-904.
- Boers, F., Warren, P., Grimshaw, G. & Slyanova-Chanturia A. (2017). On the benefits of multimedia annotations for Vocabulary Uptake from reading. *Canadian Journal of Psychology*, 45(3), 255-287.
- Chun, D. M., & Plass, J. L. (1996a). Effects of Multimedia Annotations on Vocabulary Acquisition. *Computer Assisted Language Learning*, 30(7), 709-725.
- ELT Journal, 67(4), 459-567.
- Kowie, N., & Sakul, K. (2013). It's never too late: an overview of e-learn
- Li, M. (2018), Computer-mediated Collaborative Writing in L2 Contexts:
- Paivio, A. (1991). Dual Coding Theory: Retrospect and Current Status.
- Plass, J. L., Chun, D. M., Mayer, R. E., & Leutner, D. (1998). Supporting Visual and Verbal Learning Preferences in a Second-Language Multimedia Learning Environment. *Journal of Education Psychology*, 90(1), 25-36.
- The Modern Language Journal, 80(2), 183-198.
- Zapata, G. C., & Sagarra, N. (2007). CALL on Hold: The Delayed Benefits of an Online Workbook on L2 Vocabulary Learning. *Computer Assisted Language Learning*, 20(2), 153-171