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Effects of the Computer Mediated Communication Interaction on Vocabulary Improvement

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Abstract

This study examined the effect of CMC interaction on Iranian EFL learners' vocabulary improvement. The study was carried out on the basis of a comparative design and tried to compare CMC with face to-face interactions in the Iranian EFL learners in order to see whether the learners' lexical knowledge improved by the CMC interaction. Participants of the study were advanced learners studying in a language institute. The Oxford placement test was used to determine the Iranian EFL learners' proficiency level and ensure a homogeneous sample. Then, the participants were randomly assigned to one control group (face-to-face interaction) and one experimental group (CMC interaction) in order to compare the effect of CMC on the learners' vocabulary improvement. The learners took a pre-test to select 12 target lexical items, treatment activity to perform information-gap task, and two immediate and delayed post-tests for assessing the acquisition of new lexical items. Yahoo Messenger was used to provide the chat communication. The research provided evidence that there was a significant relationship between the use of CMC interaction and face-to-face interaction with regard to improvement in the learners' vocabulary learning. The result indicated that the learners' vocabulary learning improved more in CMC interaction in comparison to face-to-face interaction. In addition, there was a significant difference in negotiating the meaning of new lexical items through CMC interaction in comparison to face-to-face interaction. Moreover, the results indicated that in terms of signal, the CMC interaction outperformed face-to-face group.

Keywords*: human computer interaction, computer mediated communication, vocabulary improvement, vocabulary learning*

1. Introduction

Learning a foreign language is a challenging task, requiring mastering a new sound system, phonological and syntactical forms, vocabulary, and sometimes a new writing system. Learning new vocabulary becomes one of the most significant tasks as one strives for fluency in the foreign language [1]. Vocabulary learning is considered as a vital part of each foreign language learner's life and as such, is important in language proficiency and academic achievement and ideas. Therefore, how vocabulary should be learned has varied widely [1].

Traditional pedagogical methods for vocabulary learning include word-lists, dictionary use, workbooks, teacher-made materials, and group discussion, which mostly present the words to be learned in isolation and without a context, but in the current period, one of the primary concerns is the need for developing effective pedagogical methods for the teaching of vocabulary [1]. In fact, computer mediated communication or "CMC may present tremendous possibilities for interlanguage pragmatic development because it affords the possibility of presenting pragmatic-based materials in a contextualized, authentic, and personalized manner" [2].

Since 1970s, learning has not been limited to the classroom: it can happen at home or in other places such as school, using the computer and other forms of technology. Today's teachers and learners live in a technology-enhanced learning environment. Videos, computers and the internet are accessible to almost all teachers and learners and in smart schools the language laboratory has been become a multimedia center that supports online learning. Technology has facilitated the shift from teacher-centered to learner-centered learning. Learners now pass the time interacting not with the teacher, but with other learners using chat rooms that provide access to more authentic input and learning processes and that make language learning available at any time [3].

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CMC, conventionally, is divided into two broad categories: asynchronous CMC (ACMC e.g., email and bulletin boards) and synchronous CMC (SCMC e.g., real-time, live discussion via online channels such as chat systems) [4]. Synchronous CMC helps learners to expand the exposure to the target language through real-time interaction [5] an issue, which is found in most of the EFL contexts particularly in Iran and needs more awareness and attention with regard to accrued advantages in vocabulary improvement and negotiation of meaning.

"Development of lexical knowledge is now regarded, by both researchers and teachers, as central to learning a language" [6], and thus one of the key concerns is the need for developing effective methods for the teaching of foreign language vocabulary. Therefore, it is tried to focus more on this area in the present study. Traditional methods for vocabulary acquisition include word-lists, dictionary use, workbooks, and so forth. Yet, developing effective instructional methods for vocabulary learning requires more attention and exploration in order to have a more successful communication. Thus, according to Chun (1994), synchronous CMC can be beneficial for EFL learners to master their language skills as well as their social interaction skills [7].

The purpose of this study is to investigate the impact of the CMC interaction on vocabulary improvement of EFL learners. It is hoped that the study adds to the findings of others concerning the possibilities of using SCMC interaction in order to improve the process of teaching vocabulary at instructional contexts, particularly in Iran.

2. Statement of the Problem

Since 1970s, learning has not been limited to the classroom: it can happen at home or in other places such as school, using the computer and other forms of technology. Today's teachers and learners live in a technology-enhanced learning environment. Videos, computers and the internet are accessible to almost all teachers and learners and in smart schools the language laboratory has been become a multimedia center that supports online learning. Technology has facilitated the shift from teacher-centered to learner-centered learning. Learners now pass the time interacting not with the teacher, but with other learners using chat rooms that provide access to more authentic input and learning processes and that make language learning available at any time [3].

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CMC interaction is preferred to traditional ways of face-to-face teaching and learning because it encourages more interaction among learners than face-to-face interaction and creates an environment with less psychological pressure to use a foreign language. CMC, in particular, chatting enables learners to speak with decreased anxiety and allows them to hide their personal information such as race and gender that might lead to positive/negative effects or biases in oral performance in an EFL context.

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In spite of the crucial role of vocabulary development in order to communicate competently in the target community, this issue is a little studied one with respect to synchronous computer mediated communication and few studies have concentrated on this issue in a particular EFL setting, Iran. This research gap suggests the need for exploring the differential effects of CMC interactions on lexical learning. For this reason, the study attempts to fill in that gap.

3. Review of the Literature

Luan and Sappathy (2011) argued that negotiated interaction allows for practice in the target language particularly when there is little opportunity for the learner to do this outside classroom situations. They mentioned that the "act of negotiation is supposed to have a lasting effect on memory and research has shown that negotiated interaction is especially beneficial for the acquisition of vocabulary items, in particular concrete nouns" [8].

In Tabatabaei and Sharifi's (2011) study suggested that using on-line chatting could result in progress of learning a foreign language (i.e., accuracy of their speech) through self-repair. On-line chatting provided the participants with a unique opportunity to put their grammatical knowledge into practice through meaningful communication. They concluded that on-line chatting activities enabled the learners to attend to both linguistic forms and communicative contents, resulting in meaningful communication in more accurate linguistic forms or negotiation of meaning in their foreign language [9].

Lee's (2009) study indicated that the students in text-chat, voice-chat and face-to-face interactions all were involved in negotiated interaction in order to resolve their comprehension problems. The result for the text-chat group (TCG) was not surprising because learners in TCG were interacting in a written environment and the written mode of synchronous chat helped them monitor and pay more attention to both their input and output. Lee concluded that a voice-chat also might help in the development of both oral and written skills [10].

Rezaee and Ahmadzadeh (2012) examined the effect of integrating synchronous and asynchronous CMC (ICMC) with Face-to-Face Communication (FFC) on vocabulary improvement among 88 EFL learners. The findings showed that, although FFC participants made some gains in their post-test scores, there was no significant difference in their performance, meaning that they had not improved vocabulary significantly but integrated CMC participants showed statistically significant improvement in their performance in the two sets of observations [11].

Smith (2008) reported on a study of the use of self-repair among learners of German in a task-based CMC environment. The results showed that relying on printed chat logs alone when analyzing SCMC data was a very uncertain undertaking. It was also found that learners self-corrected in an SCMC task-based setting, perhaps due to a heightened degree of noticing, which was fostered by the SCMC environment itself. In addition, learners seemed to correct grammatical points more often than lexical points, though this difference was not statistically significant [12].

Abe (2011) studied text-chat in the Japanese EFL context comparing the use of face-to-face (FTF) interaction and synchronous computer-supported collaborative learning (CSCL). The results showed that the collaborative pattern was more predominant in both modes that might be relevant to the participants' positive attitude toward group work interaction, restructured the power relationship and allowed more individualized control of the learning environment, and was likely to induce a strong group sense among learners [2].

Hezili (2009-2010) attempted to investigate the negative side of the chat overuse by 20 students and its negative effects on their writings. The most important conclusion was that the overuse of chat played a crucial role in affecting negatively the students' writings. She demonstrated that syntactical structure often spoken-like, eccentric spelling and specific 'e-style' features were used abundantly in the students' written productions so that over time students chatters would lose the ability to spell or use punctuation appropriately as a result of the time spent online [13].

Ghabanchi and Anbarestani's (2008) study indicated that learners using computer assisted language learning (CALL) program, had an intensive mental processing, which resulted in long-term recall of words and a better retrieval in vocabulary learning. Ghabanchi and Anbarestani argued that though CALL was a better way of expanding lexical knowledge in the short-term, the purpose of learning new vocabulary should also be considered [1].

Results of Miles and Kwon's (2008) study indicated that the CALL vocabulary instruction groups were more successful than the traditional vocabulary study groups. For both receptive and productive use of vocabulary, learners who used the CALL vocabulary program with the merits of spaced repetition presentation were more successful, which followed more conventional methods of study [14].

Al-Bataineh (2010) examined the effect of the internet on improving university students' writing performance. The results indicated that students working with the e-mail enjoyed

significant benefits in their writing performance in comparison to the students in the traditional group [15].

Pazio's (2010) conducted a case study on a blended course consisting of the face-to-face component and asynchronous computer mediated communication in the form of e-mail exchanges between a native speaker (NS) of English and a Polish non-native speaker (NNS) learner of English. It revealed that having an opportunity to correspond with the NS, the NNS expanded her vocabulary knowledge mostly due to imitating the NNS's structures, eliminated the majority of her spelling mistakes and changed her style of writing into a more formal and sophisticated style [16].

Tsukamoto et al (2009) mentioned the advantages of using CMC for schools and teachers as the chances for interaction with native English speakers, the exposure to the wider world, and the possibilities for educational and economic development. Another possible advantage of computer-mediated communication in Warschauer's (1996) study was that students used language, which was lexically and syntactically more formal and complex in electronic discussion than they did in face-to-face discussion [17].

Zarei and Dadebiglo (2008) demonstrated that the computer-mediated interaction (CMI) group at both advanced and elementary levels outperformed the face-to-face oral interaction group on both written and oral vocabulary recognition and production tests [18]. The results of Luan and Sappathy's (2011) study confirmed that negotiated interaction had its value in development of the acquisition and retention of vocabulary items among average proficiency primary school students where concrete nouns were concerned. They argued that interaction enabled learners to work together for meaning, whereas in traditional classroom teaching/learning sessions, where the teacher provided information through one-way input, learners had little opportunity to produce the target language [8].

4. Methodology

As previously noted, the study aimed to explore the impact of the CMC on vocabulary improvement of Iranian EFL learners. The study was conducted on the basis of a comparative design and tried to compare CMC with face to-face interactions in the IranianEFL learners in order to see whether the learners' lexical knowledge improved by the use of chat.

4.1. Study Sample

The study participants are Iranianmale EFL learners in order to consider the impact of the CMC on their vocabulary improvement. Then, 32 language learners were chosen as study population.

4.2. Instruments

An Oxford placement test was administered among 50 learners to ensure that the intended participants were roughly at the same level of language proficiency. Information-gap task was used as the main instrument for the exchange of information between participants of the study; that is, one participant provided some information that the other participant had received it in order to solve a problem together. Another main instrument was Yahoo Messenger that was used for synchronous chat in the study. Furthermore, participants engaged in a treatment activity. They performed two paired, interactive, information-gap activities for about 30 minutes. Moreover, an immediate and delayed posttest was used after completing the treatment activity in order to determine the improvement in lexical knowledge.

4.3. Data Collection Procedure

After estimating the reliability of the OPT, the learners answered three sections of the test, including grammar, vocabulary, and reading comprehension. The maximum possible score was 60 points and a total number of 32 advanced intermediate participants out of those 70 learners were selected based on OPT direction. As discussed above, a pre-test was performed in the study. This phase was performed one day before the treatment activity. The participants' lexical knowledge was determined through their written knowledge. Therefore, before the treatment activity, participants were given a pre-test to select target lexical items. Then, the researcher read and reviewed the participants' responses, which were gathered by the teacher. It is noteworthy to mention that these 12 words were obtained from the participants' own

responses and employed as lexical items for the main part of the study. The next phase of the data collection procedure was undertaken by a treatment activity one day after pre-test. The treatment activity began with two paired, interactive, information-gap tasks for about 30 minutes. In this phase, the face-to-face group (N=16) was divided into eight pairs who worked together. Each pair had an information gap task. Then, the other six pictures and their respective names and information were communicated between the new roles according to the above-mentioned guidelines and the same procedure was followed. In fact, the same procedure continued between them with reversedroles. Totally, each of the participants negotiated lexical meaning for 12 different words in face-to-face group. After completing the activity of the face-to-face group, the participants in the chat group (N=16) went to the language class. They sat in front of computers individually and communicated with their partners via Yahoo messenger software.

The pictures of the target lexical items were saved in a specific file for participants and the participants were told how to use them during their chatting.The teacher explained to each learner that he would be shown six pictures. All correspondences were saved so that the data could later be coded. These participants did the same work that the face-to face interaction group did. The only difference was that the tasks were computer mediated; that is, participants communicated with each other via chat. Finally, the researcher controlled all the teacher's records of learners' observations and their transcripts for chatting and then copied and saved all outputs as a word-document for more analysis. Immediate posttest was administered after completing the treatment activity. The participants were asked to speak in English the target word corresponding to the picture, and then type the target word corresponding to the picture in English on their computer screensfor examining their lexical knowledge. Then, delayed post-test was performed one week after the immediate post-test and the procedure was the same as that for the immediate post-test. Then, the results of the pre-test and two post-tests were used to assess the differences in word knowledge before and after the treatment.

4.4. Data Analysis Procedure

The Statistical Package of Social Sciences (SPSS, version 22) was used to analyze the data. To investigate the possible differences among the participants, a One Way Analysis of Variance (ANOVA) was run to the results of the pre-test. To find out the location of the possible differences among the two groups, a scheffe test was conducted.

5. Results

This study was an attempt to investigate the impact of the CMC interaction on vocabulary improvement of EFL learners. To this end, the data gathered from the pretest and posttests were used. The section analyze the data obtained from learners' information exchanged in face-to-face and chatting classes and ends up with the discussion and interpretation of the results with respect to the research questions.

5.1. The Results of Pre-Test

The main goal of administering the pretest was to set a baseline, from which students' performance on the post-test could be evaluated. To test the fairness of variance presumption for the pretest, One Way ANOVA was run to the results of the pre-test.

Table 1 shows the results of ANOVA for the pre-test scores of vocabulary test (pre-test). Results of One Way ANOVA reflected that there was no significant difference in learners' performance in terms of their lexical knowledge on the pre-test across the three groups (F2, 21=.318, p vocabulary test=0.731 ≥ 0.05).

Table 1. One-way ANOVA for the Pretest Scores

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.333	2	.167	.318	.731
Within Groups	11.000	21	.524		
Total	11.333	23			

As seen in Table 1, the significance value of the F test in the ANOVA table was higher than (0.05) for the pretest. Thus, the average assessment scores of vocabulary were equal

across the three groups at the beginning of the study. Table 2 presents the results of the immediate post-test on the vocabulary improvement.

Table 2. ANOVA for the Results of the Vocabulary Test (Immediate Post-Test)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	111.583	2	55.792	3.775	.040
Within Groups	310.375	21	14.780		
Total	421.958	23			

As shown in Table 2, the significance value of the F test in the ANOVA was less than 0.05. Thus, the hypothesis that average assessment scores of the vocabulary test (immediate post-test) were equal across the three groups was rejected (F 2, 21=3.775, Sig.=.040≤.05). In general, according to Table 2, F statistics established that there was statistically a significant difference between the three groups' means, and means plots showed the location of these differences. Participants of the voice-chat group outperformed their counterparts namely chat and the face-to-face groups. Table 3 shows the results of running paired samples test for the pre- and post-test.

Table 3. Paired Samples Test for the Pre- and Post-tests

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	chat pretest –chat posttest1	-13.12	4.3239	1.52	-16.73	-9.51	-8.58	7	.000
Pair 2	Face to face pretest - facetofaceposttest1	-13.00	2.8784	1.01	-15.40	-10.59	-12.7	7	.000

As depicted in Tables 2 and 3, all the three groups had progressed in the immediate post-test. Based on the results of paired t-test, this progress is statistically significant for all the three groups (P ≤0.05). In other words, all the three groups made a substantially higher progress in the post-vocabulary test. These results also rejected the null hypothesis that there is no significant difference between CMC interaction and face-to-face interaction groups in relation to vocabulary improvement. It is notable that the progress of chat group and face-to-face group was somehow similar; that is, there was no significant difference between chat and face-to-face groups. In order to evaluate the extent of retention of the new lexical items, paired samples t-test was run to the results of the immediate and delayed posttests. As shown in Table 4, the findings showed no significant difference among the three groups on immediate and delayed posttests.

Table 4. Paired Samples Test for the Immediate and Delayed Posttests

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	- chat posttest1 – chat posttest2	-.625	1.18773	.419	-1.617	.3679	-1.48	7	.180
Pair 2	Face to face posttest1 – face to faceposttest2	-.250	1.38873	.490	-1.411	.9110	-.50	7	.626

According to Table 5, multiple comparisons revealed the following differences between the two groups. These groups differed very slightly from each other: chat group and face-to-face group (p=.979; the mean difference=.42).

Therefore, given the obtained sig=0.049 that is simply .001 lower than .05, it seems reasonable to see no significant differences between the pairs. In summary, according to the findings, there is no significant difference in negotiating the meaning of new lexical items through synchronous CMC interaction in comparison to face-to-face interaction.

Table 5. Multiple Comparisons for the Negotiation of Meaning Types

Dependent Variable: Frequency of Negotiation of Meaning Types Scheffe						
(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
chat based group	chat based group	-4.35714	2.07638	.124	-9.6412	.9269
	face- to- face group	.42857	2.07638	.979	-4.8555	5.7126
face- to- face group	- chat based group	-.42857	2.07638	.979	-5.7126	4.8555

6. Discussion and Conclusion

This section investigates and discusses the research questions and null hypotheses according to the findings of the study. In summary, it was found CMC interactions and face to-face interaction significantly affect Iranian advanced intermediate EFL learners' vocabulary learning immediate vocabulary test. However, there was no significant difference among the three groups on immediate and delayed posttest. In other words CMC interactions and face to-face interaction do not significantly affect Iranian advanced-intermediate EFL learners' retention of vocabulary learning. As seen in the results section, CMC interaction improved learners' vocabulary knowledge.

This result is compatible with Lee's (2009) study who reported that all CMC interactions facilitated the acquisition of L2 words and ensured a good level of retention [10]. Moreover, it is compatible with Rezaee and Ahmadzadeh's (2012) study who demonstrated that although FFC participants made some gains in their post-test scores, there was no significant difference in their performance. It means that their vocabulary improvement was not significant in FFC group but integrated CMC participants showed statistically significant improvement in their performance compared to the face-to-face group after the treatment [11]. In addition, the findings of present study are similar to Al-Jarf's (2007) study, in which online instruction had an effect on vocabulary development. With regard to the retention of vocabulary learning, the result of the present study showed that CMC interactions and face-to-face interaction in the delayed post-test did not significantly affect Iranian advanced -intermediate EFL learners' retention of vocabulary learning [19]. This finding differs from [1] and [14] studies who found that CALL program resulted in long-term recall of words and a better retrieval in vocabulary learning. Therefore, according to the results of the present study and Blake's (2000) conclusion, doing tasks in a CMC environment could generate apperceived input, which could subsequently be used to modify and improve learners' vocabulary [20].

Furthermore, there was a significant difference in negotiating the meaning of new lexical items through synchronous CMC interaction in comparison to face-to-face interaction. It means that synchronous CMC interaction group negotiated the meaning in order to overcome their comprehension problems. This result is in line with Lee's (2009) study that indicated the students in chat, chat, and face-to-face interactions all were involved in negotiated interaction in order to resolve their comprehension problems [10]. Moreover, Lee found that both text and voice CMC interaction and face-to-face interaction, where learners need to negotiate the meaning of target words, were equally effective in improvement of both oral and written productive acquisition of L2 vocabulary meaning negotiation during interaction (computer-mediated and face-to-face).

This differs from the present study, in which negotiation of meaning was higher in voice-chat interaction [10]. As Simth (2004) argues, learners at a similar level of proficiency may ask for clarification and provide modified input in ways that are suited to their respective productive and receptive ability levels, which thus facilitate successful resolutions. He concluded that in CMC environment, learners often chose to negotiate unknown lexical items and that this

negotiation was quite effective. In most cases, this led to some acquisition of basic word meanings of previously unknown lexical items. In fact, Smith found that CMC negotiated interaction had positive effects on lexical acquisition and demonstrated that the learners' improvement in lexical knowledge through SCMC interaction, particularly through negotiation is effective. His finding was supported by the present study. In addition, the findings of the study is compatible with the study conducted by Rezaee and Ahmadzadeh (2012) who found that the CMC communication led to negotiation of meaning that induced more input and output and consequently led to more and better learning [11]. Moreover, these research findings are similar to the results reported by [18], [22] and [23] for the positive effects of CMC interaction on the learners' negotiation of meaning. As it can be observed in [20], [21], and [22] target lexical items triggered the majority of negotiation routines in CMC groups, which is compatible with the results of this study. Therefore, as Beatty (2003) states "opportunities for learning are inherently present, especially in situations in which learners need to engage in negotiation of meaning with native speakers of the target language or even with peers of non-native proficiency" [11].

6.1. Conclusions

As mentioned earlier, the study sought to understand the effect of CMC interaction on improvement in the learners' vocabulary learning. The findings of the study revealed that the learners' vocabulary learning improved more in synchronous CMC interaction in comparison to face-to-face interaction. Furthermore, it was verified that CMC interactions and face-to-face interaction did not significantly affect Iranian advanced -intermediate EFL learners' retention of vocabulary learning in delayed post-test. In other words, the research provided evidence that there was a significant relationship between the use of CMC interaction and face-to-face interaction with regard to improvement in the learners' vocabulary learning. Moreover, synchronous CMC interaction negotiated the meaning in order to overcome their comprehension problems. In simple terms, the findings showed that the higher the learners' level of CMC interaction, the better their vocabulary learning quality.

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