The Viability of Computer-Mediated Interaction and Face-to-Face Oral Interaction in Vocabulary Recognition and Production

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Abstract
The present study was conducted to investigate the effect of computer-mediated interaction and face-to-face oral interaction on the recognition and production of vocabulary by Iranian learners of English. To this end, 128 male and female high and low proficiency level learners of English participated in the study. Recognition and production of target words were assessed by receptive and productive, oral and written measures. Four independent two-way ANOVA procedures were used to analyse the data. Results showed that the computer-mediated interaction group at both levels (advanced & elementary) outperformed the face-to-face oral interaction group on both written and oral vocabulary recognition and production tests. It also turned out that although the low-proficiency level learners' written vocabulary recognition was affected by computer-mediated interaction more than that of the high-proficiency level learners, the latter experienced greater gains in written vocabulary production. The findings show that Computer-mediated interaction can be advantageous to vocabulary teaching and learning.

Key Words: Computer-mediated interaction, Face-to-face oral interaction, Vocabulary recognition, Vocabulary production

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Introduction

The essence of the 'Interaction Hypothesis' is that when L2 learners negotiate meaning, the conditions for second language acquisition are considerably enhanced because, according to Long (1996), one of the most important ways in which learners receive data for language processing is 'interaction'.

Traditionally, interaction involved activities, mostly in the classroom, that provided opportunities for the negotiation of meaning and the contextualized meaningful use of language. A relatively recent type of interaction is computer-mediated interaction (CMI), in which the participants take part in web-based on-line interactions.

Despite the almost unanimous agreement in recent literature on the significance of interaction as an essential ingredient in the learning process and the relative plethora of research indicating the crucial role of interaction in the learning of various language components such as syntax, morphology, etc., there seems to be a paucity of research on the effect of on-line negotiated interaction on vocabulary development. The purpose of this study, therefore, is to determine the role of computer-mediated interaction and face-to-face oral interaction in vocabulary recognition and production. It attempts to answer the following questions:

1- Is there any significant difference between the effect of CM interaction & face to face oral interaction on high & low proficiency-level learners' oral vocabulary recognition?
2- Is there any significant difference between the effect of CM interaction & face to face oral interaction on high & low proficiency-level learners' oral vocabulary production?
3- Is there any significant difference between the effect of interaction type on high & low proficiency- level learners' written vocabulary recognition?

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4- Is there any significant difference between the effect of interaction type on high & low proficiency level learners' written vocabulary production?

Anderson (2003) and Wang (2004) define 'interaction' as both the goal and means of communicative language learning. Many researchers consider interpersonal interaction as a fundamental requirement of second language acquisition. Cheon (2003), for example, believes that "the interactionist perspectives in SLA have placed considerable attention on the role of interaction in general, and meaning negotiation in particular, with respect to the conditions considered theoretically important for SLA" (p. 5).

Anderson and Elloumi (2004, p. 43) suggest that it is difficult to find a clear definition of this concept. Wagner (1994) views interaction as "reciprocal events that require at least two objects and two actions. Interaction occurs when these objects and events mutually influence each other" (p.8). Rivers (1987) considers interaction as the key to language teaching. Similarly, Ellis (1988) claims that second language development in classroom can be successful when the teacher not only provides an input with features of a target language, but also makes conditions necessary for reciprocal interaction.

Mackey (1999) in a study of the relationship between different types of conversational interaction and SLA, assumes that active participation is important in interaction, and suggests that:

> One of the features that facilitate language development is learner participation in the interaction. The teacher's role in the second language classroom is to build an interactive learning environment in which learners can collaborate with each other and generate meaning in the target language (p.573).

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Comprehensible Output in the Context of Interaction

Swain (1985) proposes the *'Comprehensible Output Hypothesis'*, and argues that comprehensible input is not enough for successful SLA, and that learners must also be given the opportunity to produce comprehensible output. According to Swain, the role of output is "to provide opportunities for contextualized, meaningful use" (p. 252). Long (1996) proposes *Interaction Hypothesis*, according to which, most acquisition happens during negotiation of meaning in linguistic environment. In the same vein, the interactionist views in SLA theory are based on the belief that language learning needs to be seen as "an outcome of participating in discourse" (Ellis, 2003, p. 78).

Izumi, Bigelow, Fukiwara, and Fearnow (1999) examined the effects of output on noticing and SLA. The results did not show any effects of output on the noticing of linguistic form. Izumi and Bigelow (2000) also investigated the noticing function of output and examined whether output increases noticing and leads to SLA. The result showed that the output did not always cause the learners to pay attention to the target form. Yet, Cheon (2003) believes that "although the results do not show the effects of output, the opportunities given to the learners to produce output and receive input were found to be important in improving their use of the grammatical structures" (p.12).

Branden (1997) studied the effects of negotiation on language learner's output. The results showed that negative feedback the participants received and negotiations modified their output and that negotiations also had significant delayed effects. Shehadeh (1999) studied the role of nonnative speaker-nonnative speaker (NNS-NNS) interaction and the role of self-initiation in providing opportunities for the production of comprehensible output. He examined the ability of NNSs to modify their output to be comprehensible in the context of native speaker-nonnative speaker (NS-NNS) and NNS-NNS interactions and the extent to which such modified comprehensible output was self-initiated. He concluded that "most of the repairs were self-initiated and

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that NNS-NNS interactions produced more other-initiations and other-initiated modified comprehensible outputs" (Shehadeh, ibid, p.665).

Meaning Negotiation and Language Learning

Pica (1994) defines the term 'negotiation' as "the modification and restructuring of interaction that occurs when learners and interlocutors anticipate, perceive, or experience difficulties in message comprehensibility" (p.494). He claims that meaning negotiation helps learners make input comprehensible and modify their own output. It also provides opportunities for them to access L2 form and meaning, and aids learners to succeed in SLA.

According to Gass (1997), "negotiation refers to communication in which participants' attention is focused on resolving a communication problem as opposed to communication in which there is a free flowing exchange of information" (p.107).

Ellis (1990) believes that L2 acquisition happens when the learners have more opportunities to negotiate meaning when there is a kind of communication difficulty. On the other hand, people like Sato (1986) argue that the role of interaction in language acquisition is really more complex, and Long (1996) points out that "it is advisable to see the role of interaction, not as a cause of acquisition but a facilitator" (p.69).

Benefits of negotiation of meaning were first studied in NNS-NS oral exchanges, but other investigations have shown that advantages exist in NNS-NNS oral discussions as well. Gass and Varounis (1994) examined NS-NS, NS-NNS, and NNS-NNS conversations, and noted that negotiation of meaning is most relevant among NNS-NNS pairs. Similarly, Shehadeh (1999) concluded that "a greater amount of extended negotiation work happened in NNS-NNS interactions than in NS-NNS interactions for the modified comprehensible outputs produced" (p.685). This somehow reflects the pressure placed on NNSs to stretch their interlanguage capacity to the limit in order to make themselves understood. Furthermore, Blake (2000) demonstrated that

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incidental negotiations mostly happened in NNS-NNS discussions through computer-mediated interaction.

As to the effectiveness of pushed output, De la Fuente (2002) shows the benefits of oral productive acquisition of L2 vocabulary in interactive tasks where learners were pushed to produce target lexical output. Cheon (2003) concludes that "doing negotiated interactions, where learners did not produce output resulted in the same levels of vocabulary acquisition. It seems that negotiations that emphasize the lexical aspect of the language may be beneficial for L2 vocabulary acquisition" (p.18).

SLA, Interaction, Computer-Assisted Communication, and Vocabulary Learning

The history of language learning and teaching shows that language has been treated in different ways. Recent literature has focused on Computer-Assisted Language Learning (CALL) or Computer-Assisted Second Language Acquisition (CASLA) (Chang & Smith, 1991; Dunkel, 1991; Levy, 1997). According to Warschauer (1996), CALL has developed in several stages: behavioristic/structural CALL, communicative CALL and integrative CALL. Warschauer and Healey (1998) describe interactive CALL and believe that students use "a wider variety of technological tools where language learning becomes ongoing rather than something that occurs in isolation in the computer lab" (p. 67).

Considering the central importance of communication and interaction, the success of language instruction in learning environments other than face-to-face has been the subject of much debate among researchers. With the advent of computer-mediated communication (CMC), interaction and communication can now be facilitated with Open and Distance Learning (ODL), but there still remains some uncertainty among experts as to whether the level and quality of interactivity needed for Second Language Acquisition (SLA) can be achieved in this medium.

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CMC can be advantageous in several ways. It has asynchronous and synchronous modes. The asynchronous mode of CMC includes things such as e-mail and bulletin boards. In this mode, participants do not need to be on-line simultaneously. Sproull and Kiesler (1991) describe some of the advantages of e-mail communication; they believe:

> Ordinarily when people communicate, they are not just exchanging information; they are projecting an image of themselves. This knowledge can make them stay in front of others, especially those whose respect they most desire. Ephemerality and plain text in electronic mail reduce the fear of appearing foolish in front of others. By removing reminders of a possibly critical audience, electronic mail induces people to be more open (p. 42).

The synchronous mode of CMC includes activities such as online oral chat, which are more anxiety-inducing due to time pressure and real voice, but reflect a more natural use of language than the asynchronous mode.

Another very important advantage related to the social context of CMC is that "communication technologies weaken social differences apparent in face-to-face communication" (Sproull & Kiesler, 1991, p. 43). Roed (2003) supports this and advocates electronic environments on grounds that "there are no immediate (negative) reactions such as giggles or raised eyebrows" (p.170). Similarly, Kitade (2000) notes that quiet learners are more expressive in CMC environments in contrast with face-to-face interaction, and that the absence of authority in CMC facilitates interaction although there is the lack of nonverbal cues. Furthermore, Stockwell (2003) describes some advantages of using e-mail based on previous studies claiming that the use of e-mails increases motivation, reduces stress, increases participation and creates opportunities for authentic communication and learner autonomy.

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Vocabulary learning has always been a popular subject in CALL programs. Tozcu and Coady (2004) compared computer-based and face-to-face interaction and used asynchronous interactive program for vocabulary learning. The experimental group studied, practiced, and reviewed tasks by means of a computer program over 24 hours throughout the semester. The control group read two articles each week and completed reading comprehension exercises. Comparing pretest and an eight-week delayed posttest, the researchers concluded that while vocabulary knowledge and reading comprehension of both groups enhanced, the experimental group did better than the comparison group.

Groot (2000) studied the effects of vocabulary software on the acquisition of L2 vocabulary. He used a computer program called CAVOCA, which involved three learning stages: deduction, usage, and examples. CAVOCA involves some tasks that provide learners with opportunities to practice words in different contexts, and allow students to produce the words and check their understanding of words. The participants were divided into an experimental (CAVOCA) and a control group. After only two learning sessions, both groups experienced a higher level of retention in immediate and a 3-week delayed posttest, but the score of the experimental group was higher than that of the control group in delayed cloze tests. Taking these findings into account, Groot concluded that practice through CAVOCA facilitated L2 vocabulary acquisition.

Arvan and Musumeci (2000) compared second and third semester learners of L2 Spanish. The control group attended classes for four hours a week and completed paper homework while the experimental group attended classes for 2 hours each week and completed online homework. Results showed that third semester students in the experimental group outperformed third semester students in the control group on tests of L2 grammar, vocabulary, listening and reading.

Heins and Duensing (2007) report that online audio, compared with written CMC, develops better oral language acquisition and speaking

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skills. They also quote Hampel and Hauck (2004), according to whom "audio-graphic conferencing provides opportunities for input, output and negotiation of meaning" (p. 283).

Loewen and Erlam (2006) found that students who were involved in CMC produced more language than their fellow students in the classroom. CMC was more interactive than the classroom. They report that students asked more questions of fellow students, gave more feedback, and requested more clarification. Beauvois (1998) also found that there was reduction in code switching. But, Loewen and Erlam (2006, p. 2) believe that little is known about how the environment of computer-mediated learning differs from the classroom and whether the same variables which are necessary for acquisition in classroom environment are important for learning in the CMC context.

Research seems to suggest that CMC causes a great amount of language production, but does quantity guarantee quality? Loewen and Erlam (2006) found that synchronous CMC can indirectly improve oral proficiency and that students in CMC condition made greater progress in oral proficiency than those in control condition (who received the same instruction in face-to-face class lessons). Likewise, Beauvois (1997) reports that "students who had participated in CMC did better than their non-CMC peers in oral exams" (p. 2).

However, there are other research findings that contradict the above studies. Abrams (2003) found that students who were involved in CMC produced more language than their fellow students, but there was no difference in quality. Kern (1995) found that there was reduced attention in grammatical accuracy. Kung (2004, cited in Loewen and Erlam, 2006) contends that "the transcripts in chat line were full of misspelled words and grammatical errors", and concludes that "quick interactions cause reduction in accuracy and coherence of discourse that students produce" (p.3). Meskill and Anthony (2005) found that learners were more interested in continuing discussions rather than paying attention to

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each other's mistakes. Jepson (2005) found fewer numbers of repairs in text chat in comparison to voice chat contexts.

A number of studies have addressed the issue of the extent to which focus on form is possible in CMC environment. It seems that there are some factors that cause learners to focus on form and some factors that prevent such a focus. According to Payne and Whitney (2002), CMC allows learners to focus on form because they have the opportunity to plan what they say.

Salaberry (2000) suggests that text-based CMC provides a natural way to link a focus on meaning with a focus on form. Abrams (2003) states that CMC is based on literacy skills; that is, there is pressure for learners to decode and encode meaning. Iwasaki and Oliver (2003) conclude that in CMC students may have greater planning and processing time. It seems that the opportunities students have to focus on form in CMC depend on time available for them to decode and encode messages. In synchronous CMC students have less time than in asynchronous CMC.

Blake (2000) shows the effect of learner-computer interaction on L2 vocabulary acquisition and states that synchronous computer-mediated interaction provides the conditions for interlanguage vocabulary development and improves L2 vocabulary learning. It can be hypothesized that online interaction negotiations include the same processes and the same conditions that exist in face-to-face interactions for L2 vocabulary development. However, the special features of CMC (i.e. text-based, between text and oral communication, absence of non-verbal communication, differences in social patterns, turn-taking, interruptions) create very different conditions for interaction.

Some studies also show that learners who receive instruction through computer-based or web-based programs have positive feelings toward their learning. For instance, Yang and Chen (2007) did a study that explored participants' views about integrating CMC in language

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learning activities. The subjects were 44 10th-grade students who participated in computer and Internet-based teaching/learning activities such as group e-mailing and web-based instruction. They liked and approved of learning English using the computer and the Internet.

What all the aforementioned extensive research implies is that CMC may be an effective way to increase learner involvement and negotiation of meaning in language classes, which can, in turn, improve their language learning in general and vocabulary learning in particular. Although most of the recent interactionist, task-based research has focused on studying the effects of computer-based negotiation of meaning on production and acquisition of L2 morphological and syntactical features of L2 (Mackey, 1999; Nobuyoshi & Ellis, 1993), little research has studied the potential effects of computer-based meaning negotiation on L2 vocabulary development. This study intends to investigate how certain vocabulary-focused, interactive, online learning tasks affect L2 vocabulary recognition and production of Iranian learners of English.

Method

Participants

The participants of the study were 128 elementary & advanced level Iranian students at various language institutes in East Azerbaijan province. They volunteered to participate in the study and were selected for their familiarity with using chat program. Although they were placed at different proficiency levels by the language institutes, their proficiency level was checked using a general proficiency test. They also differed in terms of age and were both males and females. Because of the limited number of computers (i.e. 8), the participants were randomly divided into 16 groups of 8 members each; 8 groups were experimental and 8 groups were control groups as summarized in Table 1.

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Table 1
Participants of the study

	Type of interaction			
Language Proficiency Level		CM interaction	Oral interaction	
	HIGH	8	8	64
		8	8	
		8	8	
		8	8	
	LOW	8	8	64
		8	8	
		8	8	
		8	8	
		64	64	

Instrumentation

Different data collection instruments were used in the present study as follows:

1. A general proficiency test administered to all participants to make sure that the division of them into the high and low proficiency levels by the institutes was all right and that the participants of each proficiency level were homogeneous.
2. A pre-test consisting of a total number of 80 items in two segments (productive and receptive knowledge segments) was administered a day before the treatment. The purpose of the pretest was to identify the words of which the participants had no background knowledge.
3. Four posttests of oral production, oral recognition, written production, and written recognition were also used. Each test contained 10 items selected from among the target words taught as treatment. The production tests were in fill-in-the blank format and the recognition tests were in multiple-choice format.

Procedure

Following the pretest and data collection, the words of which no participant in each group had previous receptive and productive knowledge were selected for inclusion in the posttests. In the 'face-to-face' interaction group, participants were divided into dyads to receive a

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task with an information gap format. Based on the task, each dyad had to have a telephone conversation in which one of the speakers had to buy some items in the supermarket for dinner, but first had to consult her/his partner about the shopping list. The speaker giving instruction had a list of five pictures. In the list, the English term was given for each of the pictures (e.g., *one kilogram of plums*). The other speaker had a blank sheet and had to write the shopping list (five items) in English. Using Persian was not allowed in doing the tasks. The information receiver had to negotiate the meaning of each of the words and the information provider had to modify his/her input in order to be understood. Dyads were given 1 minute to negotiate each of the words. After this, the participants traded roles (information providers became receivers, and vice versa). The speaker giving instruction received a similar list with five pictures (the other five target words) and had to do the same thing in the same amount of time. Although each participant, at the time of giving instructions, had the written form of the target words, the focus was on oral interaction and participants used their receptive and productive oral skills.

In the CM interaction group, the pairs worked in a computer lab, sitting in front of separate computers. They were given the same tasks as the Oral Interaction group. The only difference was that the tasks were networked and computer-mediated; that is, students had to communicate with their partners via chat. Therefore, this time, the information provider had to give written, instead of face-to-face instructions. Given the fact that typing needs a longer time than oral production, the time increased to 2 minutes for every item (instead of 1 minute). The participants in the online chat group never heard the target words, so the focus of the task was written recognition and production. All of the conversations were computer-mediated and synchronous.

Data Analysis

After the required data were collected, four independent 2-way ANOVA procedures were used to compare the performance of the two groups

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(CM and Oral) at two levels of advanced and elementary on the recognition and production of English vocabulary.

Results

The quantitative and qualitative results of the participants' performance on both recognition and production tests were as follows:

Oral vocabulary recognition

The first research question sought to investigate the difference between the effect of CM interaction and face-to-face oral interaction on high and low proficiency level learners' oral vocabulary recognition. In this regard, descriptive statistics including the mean and standard deviation are summarized in Table 2.

Table 2

Descriptive statistics for the Oral Vocabulary recognition

Group	Level	Mean	Std. Deviation	N
Oral	Low	2 .5938	1.89838	32
	High	5 .8125	2.84477	32
CM	Low	3.5938	.79755	32
	High	6.2500	1.31982	32

In order to see whether or not the differences between the groups are statistically significant, a 2-way ANOVA procedure was run, the results of which are presented in Table 3.

Table 3

The result of the two-way ANOVA on learners' oral vocabulary recognition

Source	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Group	16.531	1	16.531	4.698	.032	.037
Level	276.125	1	276.125	78.475	.000	.388
group * level	2.531	1	2.531	.719	.398	.006

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As Table 3 indicates, a between-subject test showed a significant main effect of group, F = 4.698, p=.032. The results also showed a significant main effect of level, F =78.475, p=.000, but no significant interaction effect between group and level. As shown in Tables 2 and 3, the CM interaction group has significantly higher oral recognition scores than the face-to-face oral interaction group (p<.05). Therefore, we can safely claim that there are significant differences between the groups. The partial Eta square value indicates that although the difference between the experimental and comparison groups is statistically significant, CM interaction accounts for only 3 percent of the total variance, and proficiency level accounts for nearly 39 percent of it. Also, it can be concluded that high proficiency level learners in both groups did better than low proficiency level learners.

Oral vocabulary production

The second research question was put forth to investigate the difference between the effect of CM interaction and face to face oral interaction on high and low proficiency level learners' oral vocabulary production. Descriptive statistics including mean scores and standard deviations for the oral vocabulary production for two groups of high and low proficiency levels are provided in Table 4.

Table 4
Descriptive statistics for the oral vocabulary production

Group	Level	Mean	Std. Deviation	N
Oral	Low	2.9688	1.71303	32
	High	4.5625	3.21225	32
CM	Low	3.3750	1.62143	32
	High	5.9687	1.35562	32

To see whether the differences between the groups are statistically significant, another 2-way ANOVA procedure was run. The results of the ANOVA procedure are presented in Table 5.

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Table 5
The result of the two-way ANOVA on learners' oral vocabulary production

Source	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Group	26.281	1	26.281	5.933	.016	.046
Level	140.281	1	40.281	1.667	.000	.203
group * level	8.000	1	8.000	.806	.181	.014

A look at the results presented in Table 5 makes it clear that there is significant main effect of group, F =5.933, p=.016, and a significant main effect of level, F =31.667, p=.000, but no significant interaction between group and level. Based on Tables 4 and 5, the CM interaction group has significantly higher oral production scores than the face-to-face oral interaction group. We can claim, therefore, that there are significant differences between the groups. It can also be observed that the high proficiency level learners in both groups outperformed those in low proficiency level. Moreover, Partial Eta square values indicate that proficiency level accounts for a considerably greater amount of the total variance than the kind of interaction.

Written vocabulary recognition

The difference between the effect of CM interaction and face to face oral interaction on high and low proficiency level learners' written vocabulary recognition was stated in the third research question to be investigated. Descriptive statistics for the written vocabulary recognition of the two groups of high and low proficiency levels are given in Table 6.

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Table 6
Descriptive statistics for the written vocabulary recognition

Group	Level	Mean	Std. Deviation	N
Oral	low	2.6875	1.11984	32
	high	5.8125	2.54555	32
CM	low	5.9688	2.36213	32
	high	7.4062	1.45601	32

To know whether or not the differences between the groups are statistically significant, the 2-way ANOVA procedure was used. The results of the ANOVA procedure are presented in Table 7.

Table 7
The result of the two-way ANOVA on learners' written vocabulary recognition

Source	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Group	190.125	1	190.125	49.276	.000	.284
Level	166.531	1	166.531	43.161	.000	.258
group * level	22.781	1	22.781	5.904	.017	.045

According to the results presented in Table 7, between subject tests showed a significant main effect of group, $F = 49.286$, $p = .000$, and a significant main effect of level, $F = 43.161$, $p=.000$. The tests also showed a significant interaction effect between group and level, $F = 5.904$, $p = .017$. In other words, a significant differential change between the two groups was found. As shown in Table 6, the CM interaction group has significantly higher written perception scores than the face-to-face interaction group ($p<.05$). Therefore, it can be claimed that there are significant differences between the groups. It can also be concluded that high proficiency level learners in both groups have outperformed low proficiency level learners. Furthermore, although both groups have benefited from CM interaction, the effect of CM interaction on the

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written vocabulary recognition of the low proficiency level learners is more than that of the high proficiency level learners.

Written vocabulary production

The fourth research question was about the difference between the effect of CM interaction and face to face oral interaction on high and low proficiency level learners' written vocabulary production. Mean scores and standard deviations for the written vocabulary production of the two groups are provided in Table 8.

Table 8
Descriptive statistics for the written vocabulary production

Group	Level	Mean	Std. Deviation	N
Oral	low	3.6563	.78738	32
	high	4.9687	2.08658	32
CM	low	3.9062	.73438	32
	high	6.5937	1.07341	32

In order to find out whether or not the differences between the groups are statistically significant, the 2-way ANOVA procedure was employed. The results of the ANOVA procedure are presented in Table 9.

Table 9
The result of the two-way ANOVA on learners' written vocabulary production

Source	Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Group	8.125	1	28.125	16.878	.000	.120
Level	28.000	1	128.000	76.815	.000	.383
group * level	5.125	1	15.125	9.077	.003	.068

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According to Table 9, results showed a significant main effect of group. That is, a significant differential change in oral production between the two groups was found. Results also showed a significant main effect of level and a significant interaction effect between group and level. As shown in Tables 8 and 9, the CM interaction group has significantly higher written production scores than the Oral interaction group. It is concluded, therefore, that there are significant differences between the groups. Also, it can be concluded that the high proficiency level learners in both groups have outperformed those in the low proficiency level. At the same time, high proficiency level learners' written vocabulary production has been affected by CM interaction more than that of the low proficiency level learners.

Discussions and Conclusion

Based on the results of the study, it can be concluded that the CM interaction groups at both levels (advanced & elementary) performed better than the oral interaction groups on both written and oral tests. Also, it is concluded that the high proficiency level learners in both groups outperformed the low proficiency level learners.

Some of the findings of the present study are in line with previous findings (Blake, 2000; Tozcu & Coady, 2004), which indicate that task-based CMC causes negotiation of meaning, and that this negotiation appears to facilitate vocabulary recognition and production of learners. The findings also support Sproull and Kiesler (1991), Roed (2003) and Kitade (2000) that computer-mediated interaction has advantages over face to face interaction. This study indicates that meaning negotiation through task-based synchronous CM interaction seems to promote L2 vocabulary learning. To explain these results, psychological and cognitive points need to be taken into account. Cognitively, it can be argued that CM interaction provides suitable conditions where learners' attention is directed towards target words, and that the increased attention may explain, at least partially, the better performance of the CM interaction group. The higher level of performance (both receptive and productive) of the CM interaction group may also be attributed

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partially to their psychological state. Since they did not have to have face-to-face oral interaction, which is intrinsically anxiety-inducing, the participants of the CM interaction group may have been in a position to make better and more effective use of their potential.

As mentioned before, another result of the present study is that high proficiency level learners in both groups outperformed low proficiency level learners. This might be partially accounted for by the fact that the greater awareness of high proficiency level learners of the subtle properties of words forces them to pay more careful attention to words, hence they learn them better. Another possible reason for the better performance of the high proficiency level learners may be their previous learning experience. Due to their longer learning experiences, compared with the low proficiency level learners, the high proficiency level learners may have enjoyed familiarity with a wider variety of effective learning strategies, which might in turn have contributed to their better achievement.

An interesting finding of the present study is that although the low-proficiency level learners' written vocabulary recognition was affected by CM interaction more than that of the high-proficiency level learners, the latter had better performance in written vocabulary production under CMC condition. This may be accounted for by the fact that the lexical reservoir of the low proficiency level learners is not rich enough to make them capable of producing words, while at the same time, there is more for them to attend to receptively than the high proficiency level learners. All findings of the study point to the several advantages CMI can have for language teaching and learning, especially vocabulary teaching. A final point that is worth noting is that the results of the present study might have been affected by the limited number of participants in each group. This fact calls for further research to be conducted with larger samples so that more reliable and generalizable findings may be reported.

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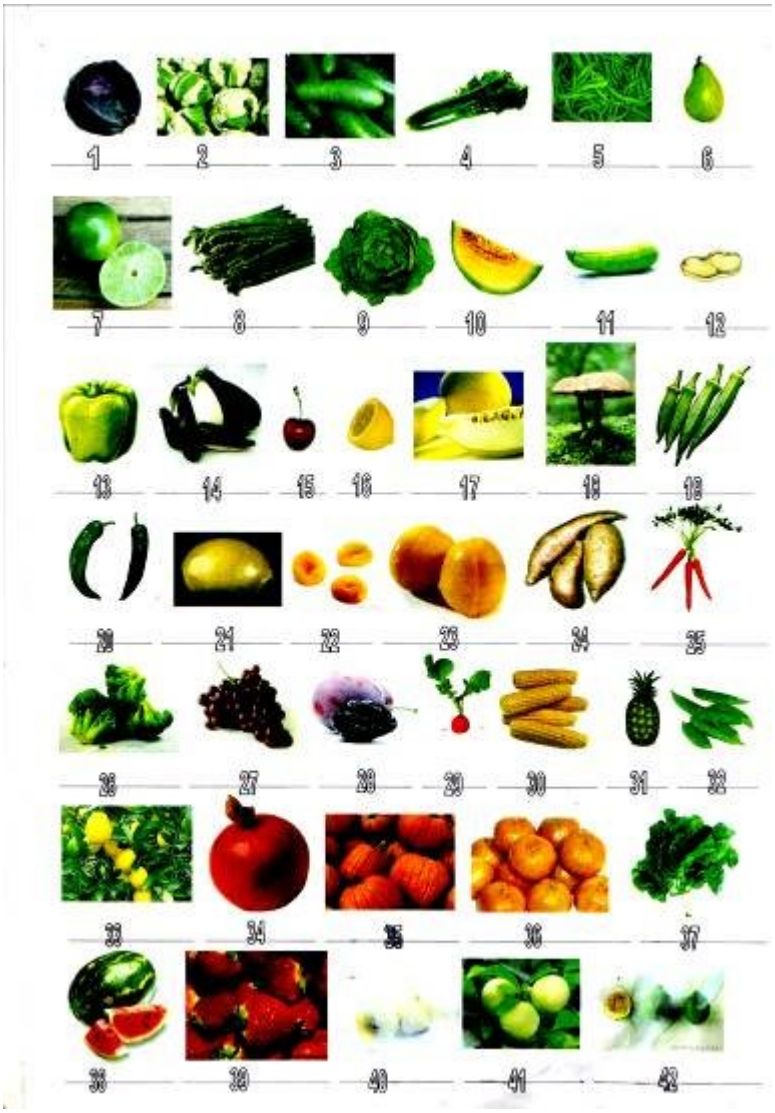
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Appendix 1: The pretest
A: Productive Knowledge Segment



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B: Receptive Knowledge Segment

Write the meaning of the following words in Persian.

1- Apricot.....
2- Apricot dried.....
3- Asparagus.....
4- Bell pepper.....
5- Broccoli.....
6- Cabbage.....
7- Carrot.....
8- Cauliflower.....
9- Celery.....
10- Cherry.....
11- Chili.....
12- Corn.....
13- Cucumber.....
14- Eggplant.....
15- Fig.....
16- French beans.....
17- Garlic.....
18- Grape.....
19- Lemon.....
20- Lettus.....
21- Lime.....
22- Melon.....
23- Mushroom.....
24- Okra.....
25- Olive.....
26- Peanut.....
27- Pear.....
28- Peas.....
29- Pineapple.....
30- Plum.....
31- Pomegranate.....
32- Prune.....
33- Pumpkin.....
34- Radish.....
35- Spinach.....
36- Strawberry.....
37- Sweet lime.....
38- Sweet potato.....
39- Watermelon.....
40- Zucchini.....

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Appendix 2: Oral tests

Oral test: Production Please record **In English** what you see in each of pictures

Oral test: Reception Listen to the following English words and record **English Translation** for each of them

Appendix 3: Written tests

A: Written test: Production

1. Look at the pictures and write the name in English in the spaces provided.



1……..



2…….



3……..



4……

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5…….



6……



7…….



8……...



9……



10……..

B: Written test: Reception

Provide an equivalent **in Persian** for the following English words.

1. Pumpkin ……
2. Pear …….
3. Watermelon …….
4. Pomegranate …….
5. Zucchini ……
6. Plum …….
7. Cherry …….

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8. Radish …….
9. Celery ……..
10. Broccoli …….

Appendix 4: Sample of task
Oral Interaction Group (student A)
Instructions: Your friend is going to the supermarket. Below is a list of TEN (10) things you need, in order to prepare dinner for you and your family. Use the phone to talk to her. Tell him/her in English what you need (**do not use Farsi to do this task**). If he/she does not understand what he/she has to buy, explain in English and use all of the details. **You have 10 minutes to complete the task.**

 1 kilogram of grapes

 1 kilogram of carrots

 2 kilograms of cherries

 2 kilograms of peanuts

 1 kilogram of prunes

 1/2 kilograms of zucchinis

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 1 kilogram of broccolis

 2 kilograms of eggplants

 1 kilogram of cabbages

 1 kilogram of pomegranates

Oral Interaction group (student B)

Instructions: You are going to the supermarket. Your friend is going to call you and tell TEN (10) things he/she needs to prepare dinner for his/her family. Listen carefully his/her instructions. If you do not understand what you need to buy, ask him/her questions (**do not use Farsi to do this task).** In the space below, write the things he/she want you to buy (write the names in **English**).

1. ……
2. ……
3. ……
4. ……
5. ……
6. ……
7. ……
8. ……
9. ……
10. …….

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