

Interactional modifications in text-based online chat and EFL question development

Jaleh Hassaskhah

Assistant Professor, University of Guilan

Seyedeh Marziyeh Chavoshi

M.A., University of Guilan

Abstract

The limited language exposure available to the learners of English as a foreign language (EFL) decreases their chance of utilizing two important practices- questions and interactional modifications- in their classrooms, which according to interaction hypothesis are influential in language development. This study thus explores the possibilities of Computer Assisted Language Learning (CALL), and in particular, text-based online chat in increasing these opportunities. To do so, a total of eighteen paired intermediate EFL students were assigned to use a synchronous chat program to complete a set of seven communicative tasks outside their classroom over a period of seven weeks' time. Their performance was later compared with that of the control group members who completed the same tasks but through in-class written interaction. The results show that participants in the former environment not only outperformed those in the latter in terms of both type and frequency of the interactional modifications, but also manifested higher level questioning abilities. However, since this study focused on the forms of questions rather than their cognitive value, further research is required to seek ways in which questions which call for speculative, inferential and evaluative thinking can develop.

Keywords: computer-mediated communication, interactional modifications, question forms development

1. Introduction

Interaction in general, and classroom interaction in particular provides language learners with the opportunity to communicate in the target language (TL) and negotiate meaning (Pica, Young & Doughty, 1987); however, one of the greatest challenges that faces the foreign language (EFL) education is how to construct an interactive learning environment outside of the classroom in which learners can exchange information and communicate ideas in TL. As Campbell (2004) pointed out, unlike second language (ESL) learners who communicate in TL outside of the classroom, the EFL learners “re-enter a world” talking their mother tongue as soon as they leave the classroom and consequently are left with little or no opportunity to use the TL they have learned in the classroom.

Many researchers in the area of CALL suggest that text-based Synchronous Computer Mediated Communication (SCMC), where users can log on and chat at the same time, is capable of providing an ideal interactive learning environment for language learners because the communication takes place in real time (Beauvois, 1998; Chapelle, 2001; Pellettieri, 2000; Warschauer & Healey, 1998). Moreover, Pellettieri (2000) posited a logical relationship between language practice through SCMC and second language development and stated that:

Because oral interaction is considered by many to be important for second language development, and because Synchronous [CMC] . . . bears a striking resemblance to oral interaction, it seems logical to assume that language practice through CMC will reap some of the same benefits for second language development as practice through oral interaction.(p. 59)

Nevertheless, despite the existence of quite a rich amount of information on the role of oral negotiation in second/foreign language development (Gass, 1997; Long, 1985; Mackay, 1999; Mackey & Philp, 1998), little is known about how CMC might impact language development and more specifically, grammar development among EFL learners. To bridge this gap, therefore, this study explores how SCMC in general and the interactional modifications in particular which occur during text-based SCMC might facilitate the development of one of the most important linguistic abilities of language learners i.e. their questioning ability. Considering the aim of the current study, the next part reviews a number of studies which explored the interactional

modifications in CMC environment in relation to grammatical development.

2. Literature Review

This part reviews research literature supporting the study. It is divided into two main parts. The first part deals with the literature reporting studies which have addressed the issue of interactional modifications in CMC environment and the second part reviews the literature on the effectiveness of CMC medium in grammatical development.

2.1 Interactional Modifications in CMC Environment

Interactional modifications such as comprehension and confirmation check, request for clarification, and self correction are “communication strategies or tactics that learners employ to adjust incomprehensible messages” (Lee, 2002, p. 3) in order to convey meaning.

The studies addressing the issue of interactional modifications in CMC environment abound (Isharyanti, 2008; Jepson 2005; Kötter, 2003; Lee, 2001, 2002) and nearly all have shown that CMC technology is capable of providing a learning environment in which interactional modifications might be generated. However, looking more closely, we notice that the contexts in which most of the experiments were done were either inside the classrooms or in language laboratories and very few were carried out in naturalistic setting -- a direct opposition to the real potential of CMC technology which is beyond any formal, temporal and spatial constraints (Warschauer, 1997).

Moreover, the systems employed for the categorization of interactional modifications by different research studies were not consistent either. For instance, Lee (2001, 2002) identified a total of ten categories of interactional modifications including: *comprehension checks, clarification checks, confirmation checks, use of English, word invention, request (for help), use of approximation, self corrections, topic shift* ,and *use of keyboard symbols as discourse makers* ; whereas, Kötter (2003) relied on eight types: *confirmation checks, clarification request; comprehension checks, repetitions, recasts, overt indications of understanding; overt indications of agreement; and overt indications of non-agreement* (p. 157) ; and Jepson (2005) added to the list by identifying *interactional self*

repetition/paraphrase, *explicit correction* and *question* as well. Still in a more recent study, Isharyanti (2008) located a more varied number of interactional modifications.

Nevertheless, although the findings as a whole were more or less similar, each made its own unique contribution to the field. Lee (2002) for example, through a comparison of the results of her study with the literature on face-to-face communication, admitted that just like in face-to-face communication, learners not only used a variety of modification devices to negotiate with each other, but also used various types and distribution of them to do so. More specifically, the modification device “request” in its specific type of “request for help” appeared to have been the most frequent, followed by clarification checks, self-correction and comprehension check (Lee, 2001, p. 238; Lee, 2002, p.280). However, in contrast to Lee’s (ibid.) finding, Kötter’s (2003) study indicated a “marked difference” between conversational repair moves in spoken interactions and in online exchanges (p. 145). He explained these differences in terms of a number of “medium-specific” factors such as written mode of communication and absence of nonverbal information (p.163). Furthermore, Isharyanti’s (2008) study uncovered that in order to understand and to be understood, the participants who engaged in online negotiation processes used a variety of interactional modifications, among which “confirmation check” (24%) was the most frequent followed by “overt indication of agreement” (21%) and “clarification request” (21%).

These similarities and differences aside, all the studies cited above suffer from certain drawbacks which prevent us from their generalization to many contexts, including this research context.

In case of Lee (2001 & 2002) for example, according to Peterson (2010, p.52), the definitions used in coding categories are “somewhat problematic”. This is in line with Kötter’s (2003) observation that maintained the definitions of *clarification checks* and *requests* substantially overlapped (p. 157). Though Jepson (2005) approached the definitions more cautiously, his analysis of the negotiation process did not account for the proficiency levels and the limited time of the study (5 minutes). Later, Isharyanti (2008) studied a more varied number of interactional modifications and tried to make an improvement to the earlier studies; however it also suffered from a lack of a control group (a typical class environment in which learners communicate face-to-face) which is certain to have its impact on the results as well as their interpretation and generalizability.

Having considered all these points, the researchers found that a study like this which can reap the benefits of the earlier studies and compensate for the drawbacks is timely. Hence, the researchers developed and employed an amalgamated system of the categorization of interactional modifications from a number of studies on internet chatting and at the same time accounted for factors such as proficiency level, time, and control group in this study (Isharyanti, 2008; Jepson, 2005; Kötter, 2003; Lee, 2001, 2002).

In the following section we provide the required grounding for this study by presenting the literature on the effectiveness of CMC medium on grammatical development.

2.2 L2 Grammar Development and Text-based Computer-Mediated Communication

Despite the popularity of research on the role of negotiated interaction in L2 development (Gass and Varonis, 1989; Mackey, 1999; Pica, 1994), the results of the existing studies are unsatisfactory and controversial partly because of their design problems (Fiori, 2005).

A review of the literature available on the role of text-based computer mediated communication in L2 grammatical development indicates that there are three different positions at work:

First, studies which hypothesize that CMC is able to boost grammar development. As an example, Salaberry (2000) by qualitatively analyzing the discourse produced by four non-natives, compared the efficacy of two environments-SCMC environment versus face-to-face environment- in fostering L2 morphosyntactic development. The findings revealed that “with respect to the use of past-tense verbal morphology across tasks, some initial changes in the development of morphological endings were more evident in the CMC session than in oral session” (p. 17). According to Salaberry (2000), due to the characteristics of the medium represented in CMC (e.g. written mode of communication, absence of paralinguistic and nonverbal information), CMC provides a learning environment in which the learners’ attention will be drawn on both form and function (p. 19).

Similarly, Pellettieri (2000) claimed that bearing a striking resemblance to oral interaction, network based communication (NBC) was capable of facilitating grammatical development (p.61). She examined online discourse produced by 20 NNSs during five 30-minute sessions. As

a result, she observed that engaging in online negotiation process is as facilitative as it is typical to oral interaction. She argued:

Because through negotiation, interlocutors can zero in on the exact source of communicative problem they are trying to resolve, and because often at the root of the problem is an aspect of the L2 form, be it lexical, syntactic, or semantic, L2 learners are even more likely to notice the problem and attend to these very aspects of form in their output while negotiating meaning. (p.61)

To conclude, the first position asserts that engaging in the process of negotiation of meaning in SCMC – as in oral negotiation-- helps grammatical development. More specifically, while negotiating meaning, the interlocutors notice the required linguistic form needed to approximate the target language. This process, known as “focus on form” has been claimed by many to be necessary for grammatical development (Gass & Varonis, 1994; Schmidt, 1990; Spada & Lightbown, 1993 as cited in Pellettieri, 2000).

Second, studies which contrary to the first position, postulate that SCMC does not help grammar development. Lee’s studies (2001, 2002), for instance, concluded that although the participants did engage in negotiation of meaning, negotiation of form rarely happened among them. She argued that due to the rapidity of the interaction occurring in SCMC, participants produced brief utterances using simple sentence structures and ignored linguistic errors (Lee, 2001, p. 239). Thus she claimed that interaction mediated via SCMC technology fostered fluency rather than accuracy. Calling for further studies on the effectiveness of CMC medium for the development of learners’ interlanguage, Lee (2001) suggested that “students need to be advised of the need to write correctly to maintain a balance between function, content, and accuracy” (p. 242).

Similarly, Sotillo (2000) comparing the syntactic complexity of 25 learners’ output produced in synchronous versus asynchronous computer mediated communication (SCMC vs. APMC) claimed that because of the fast nature of interaction in SCMC, the participants did not pay any attention to form [accuracy] while negotiating meaning (p. 97). In the meantime, due to the delayed nature of APMC, this medium was capable of generating more syntactically complex structures. Nevertheless, as Fiori (2005), stated “while Sotillo reported that grammatical accuracy may suffer in the SCMC environment, the synchronous group’s interactions in

her study exhibited fewer errors than those in the asynchronous group” (p. 569).

Third, there are those who have adopted an indeterminate position regarding the effectiveness of CMC medium for grammatical development. Blake (2000), for example, examined the online discourse of 50 Spanish learners at intermediate level of proficiency in terms of task type. Considering the potential of CMC environment for eliciting the negotiation of meaning, he concluded that “carefully crafted tasks stimulate L2 learners to negotiate meaning which. . . appear to constitute ideal conditions for SLA, with the CMC medium being no exception” (p. 133). However, according to Blake (2000), “the predominance of incidental lexical negotiations, in contrast to the paucity of syntactic negotiations was either unsatisfactorily addressed or the issue of grammatical development was totally left unanswered”. (p. 120).

These mixed findings regarding the effect of SCMC medium on the grammatical development might be explained in terms of their choice of units to measure the grammatical development and their ambiguity in defining the construct itself. For instance, while in Sotillo’s (2000) study, the target feature was “Syntactic complexity” which was defined as “the ability to produce writing that uses subordination and embedded subordinate clauses” (p. 99), Lee (2001, 2002) used sentence structure (simple sentences versus complex ones) as a measure of development, and Salaberry (2000) considered “past tense verbal endings” as the target grammatical feature. Although we have had a changing for the better pattern in the aforementioned studies, we cannot deny that further research which can remove the remaining ambiguities is still needed.

3. Purpose of the Study

The present study; therefore, was designed to have its own contribution by addressing the effect of CMC environment on the development of question forms in English among Iranian EFL learners. More specifically, the study aimed to find the answers to the following research questions:

- What are the types and the frequencies of the interactional modifications among Iranian learners in CMC versus class environment?

- Is there a relationship between group membership (CMC environment vs. class environment) and the linguistic development of question forms in English as a foreign language?

The following “method” section explains how this research examined the questions and provided estimates in answers.

4. Method

Following a mixed methods approach, this study adopted both qualitative and quantitative (a pretest-posttest, delayed posttest design) techniques to provide an in-depth analysis of the types of interactional modifications employed by Iranian EFL learners, and to explain the relationships between group membership (CMC environment vs. class environment) and the linguistic development of question forms respectively.

4.1 Participants

A total number of 36 EFL learners from a Language school in Rasht-Iran served as the participants of this study. The participants, selected based on convenience sampling technique, were at the intermediate level of language proficiency according to the school’s placement system- initial placement test and regular exit oral/written exams for each level. They were all native speakers of Persian who were receiving two 90-minute classes of English instruction weekly. Students’ participation in the study was voluntary and involved those who were already familiar with online chatting (each according to an initial survey had on the average a two-hour practice of online chatting every week prior to this study). A detailed summary of the sample's major demographic characteristics is provided in Table 1 below.

Table 1: Summary of the participants' characteristics

Number of participants		36
Gender	male	6
	female	30
Age		14-32 years old
Native language		Persian
English language proficiency		intermediate
Average hours spent on online chatting/ week		2 hours

Having selected the sample, we asked the students to do seven communicative tasks (see an example in Appendix A) with their self-selected partners for one session per week and for seven weeks outside of the classroom. This experiment was carried out during the study period at the language school. To meet the local ethics requirements, the participants and their parents' consent to contribute to this project were secured through two forms: a *contract form* with an explanatory statement (Appendix B) according to which the researchers guaranteed that participants would receive some rewards (some English books on DVD) as an incentive or perhaps a token of gratitude if they accomplished the expected tasks, and a *parental consent form* (Appendix C), in Persian, signed by the parents of all the under 18 participants.

4.2 Instrumentation

The main technology used in this study was the Yahoo! Messenger Software, a free program available for public use which allows for real time SCMC in Internet chat rooms. To keep a record of all of the written transactions entered in a chat window, the "text mode" was suggested to enable the researchers to have an instantaneous transcript of all user exchanges sent by the students to the researchers' email addresses for further analysis.

To create a context for the targeted structures to occur and to provide opportunities for the interactional modifications to take place, the researchers, following the suggestion made by Pica, Kanagy and Falodun

(1993), employed information gap tasks to make the participants exchange information in their endeavor to gain a single outcome. In addition, the selection of further communicative tasks such as “spot the difference” and “missing information” which were utilized for both treatment and tests was motivated by the recommendations made by earlier studies (Blake, 2000; Pellettieri, 2000). Table 2 presents a detailed description of each task.

Table 2: Task materials used for test and treatment

week	Task	Task instruction given to participants
1	Missing information	Work with your partner. Ask and answer questions to find the missing information.
2	Complete the drawing	Below is a drawing of Richard’s room. He hasn’t had time to put all his things where he wants them. Your partner has a complete drawing of his room. Ask him/her questions where to put all the things.
3	Complete the drawing	Below is a drawing of a kitchen. Your partner has the same drawing but with a number of objects. (E.g. glasses, pots, etc.). Ask him/her questions where to put all the things.
4	Spot the differences	You both have two similar photographs but taken at a slightly different time. Work with your partner to find as many differences between the two photos as you can.
5	Spot the differences	Work with your partner. You both have a drawing of a busy yard where you can see people doing different things. Your drawings are NOT the same. There are 9 differences. Ask and answer questions to find the differences.
6	Missing information	Work with your partner. Ask and answer questions to find the missing information.
7	Missing information	Work with your partner. Ask and answer questions to find the missing information.

4.3 Data Collection Procedure

At the beginning of the course, and prior to treatment, the researchers first oriented the students to the project and expressed the hope that they would choose to participate. After identifying the volunteers, they were put in two groups- the experimental and the control groups. The members of both groups (n=18 in each) were asked to form their own self-organized pairs (9 pairs), and complete seven tasks in total over the duration of the study, the transcripts of which had to be later sent to the researchers' e-mail addresses for further data analysis. The tasks used in this study were all selected by the researchers according to a prior needs analysis and were the same for all the students in both groups. However, while there was no time limit imposed on tasks for the experimental group, the students in the control group had to complete the tasks in the classroom context within the limited time imposed by the institute. To approximate the condition present in the experimental setting, where the interlocutors had no access to non-language factors for understanding the intended meaning, and instead had to only rely on language to communicate, the students in the control group were asked to do the same and use the written language to interact- ask questions or call for any kind of modification via writing on paper. The data obtained accordingly are presented in the following section.

4.4 Data Analysis

The data for this study were based on the transcripts of the experimental group's weekly online chatting together with the scripts of the control group's in- class interaction. All the data were coded according to thirteen different criteria (Table 3) to identify the type and frequency of the interactional modifications. The system for the categorization of the interactional modifications used by this study was heavily motivated by Isharyanti (2008), but we had to make some modifications in the system to make it more comprehensive. More specifically, two types (Explicit correction and Question) were added to Isharyanti's classification and two other types (Repetition and Use of Indonesian) were replaced (by Self Repetition or paraphrase and Use of Persian) respectively. Also, an extra column named "example" was added to it. The reliability of this new categorization was secured by asking a trained independent coder to recode a randomly-selected 25% of the data. The inter-coder agreement

obtained using Pearson product-moment correlation was found to be 0.85 ($P < 0.05$) which was strong enough to show the consistency among the coders and as a result make it appropriate to build this study upon.

Table 3: Categories, definition, and example of interactional modifications

stage	Type of interactional modification	Definition	Example
1	Confirmation check (Kötter)	A speaker's attempt to confirm that he has understood an utterance via the (partial) paraphrase (as opposed to repetition, see below) of this turn, which can simply be answered with Yes or No.	Did you mean?
2	Clarification request (Kötter)	An explicit demand for an elaboration or a reformulation of an idea, which "requires a rerun of the troublesome utterance" in question.	What do you mean by X?
3	Comprehension check (Kötter)	A speaker's attempt to prompt another speaker to acknowledge that he has understood a particular utterance.	Do you Understand?
4	Self Repetition or paraphrase (Jepson)	The repetition, in isolation, of part of or an entire erroneous utterance or its paraphrase.	Where is the lamp?(*2)

5	Self-correction (Lee)	To correct errors made on lexical items or grammatical structure.	This has been bee, I mean been.
6	Recast (Kötter)	A form-focused partner-related target-like reformulation of all or part of an incorrect utterance.	A: I live Iran. B: Do you really live <i>in</i> Iran?
7	Explicit correction (Jepson)	Interlocutor corrects the speaker explicitly.	You should say X.
8	Overt indication of understanding (Kötter)	An overt indication that a speaker has understood a particular message.	Ok, I got it thanks.
9	Over indication of agreement (Kötter)	An overt indication that a speaker agrees with what his partner said.	Yes, I agree, you're right.
10	Overt indication of non-agreement (Kötter)	An overt indication that a speaker does not agree with what his partner said.	No, I think choice B is better for him.
11	Use of Persian (adaptation, Lee)	To use Persian to substitute words or ideas in English.	second "tabagheh" instead of shelf
12	Use of keyboard symbols as discourse markers (Lee)	To signal for uncertainty or to confirm an idea or agreement.	😊
13	Question (Jepson)	Interlocutor asks a question in order to prompt the speaker to make a question	Can you try that again?

Note: Adopted from the categorization of interactional Modifications described in Isharyanti (2008).

Moreover, to examine whether there was a relationship between group membership (CMC environment vs. class environment) and development in question formation, we highlighted all the question forms produced by the participants during online negotiation and in-class interactions for detailed study. It should be mentioned that the question development in this study was examined from two perspectives: (1) accuracy perspective and (2) developmental stage perspective. In analyzing accuracy, the researchers converted the number of well-formed questions into standardized scores by computing the ratio of each participant's number of well-formed questions to the total number of questions he or she produced. These accuracy-based scores were saved for further investigation.

In addition to accuracy, we analyzed the questions for their developmental stages. Accordingly, the correctly formed questions were categorized based on the framework by Pienemann et al. (1988), shown in Table 4. The reason for using this classification is that it is the most extensive and reliable categorization. In addition, Pienemann et al. (1988) has been the most widely used classifications (Mackey & Philp, 1998) in a great number of studies. Accordingly, every student's questions were studied individually and assigned to the appropriate stage category in each task. Stage assignment was based on the highest stage from which a participant produced two linguistically unique questions. Question development was operationalized as one stage increase on either posttest or delayed posttest. To have a wider understanding of question development, the data was analyzed both descriptively and qualitatively.

Table 4: Examples of question forms and developmental stages

Stage	Description of stage	Examples
2	SVO? Canonical word order with question intonation.	It's a monster? Your car is black? You have a cat? I draw a house here?
3	Fronting: Wh/Do/Q-word Direct questions with main verbs and some form of fronting.	Where the cats are? What the cat doing in your picture? Do you have an animal? Does in this picture there is a cat?

4	Pseudo Inversion: Y/N, Cop. In Y/N questions an auxiliary or modal is in sentence initial position. In Wh-questions the copula and the subject change positions.	(Y/N) Have you got a dog? (Y/N) Have you drawn the cat? (Cop) Where is the cat in your picture?
5	Do/Aux 2 nd Q-word->Aux/modal ->subj (main verb, etc.) Auxiliary verbs and modals are placed in second position to Wh-Q's (& Q-words) and before subject (Applies only in main clauses/direct Q's).	Why (Q) have (Aux) you (sub) left home? What do you have? Where does your cat sit? What have you got in your picture?
6	Cancel Inv, Neg Q, Tag Qu Cancel Inv: Wh-Q inversions are not present in relative clauses. Neg Q: A negated form of Do/Aux is placed before the subject. Tag Q: An Aux verb and pronoun are attached to end of main clause.	Can Inv) Can you see what the time is? (Can Inv) Can you tell me where the cat is? (Neg Q) Doesn't your cat look black? (Neg Q) Haven't you seen a dog? (Tag Q) It's on the wall, isn't it?

Note. This table is based on Pienemann and Johnston (1987) and Pienemann, Johnston, and Brindley (1988) as cited in Mackey, A., & Philp, J. (1998). Conversational interaction and second language development: Recasts, responses, and red herrings? *Modern Language Journal*, 82, 338–356.

5. Results

In this section we discuss the findings in terms of the order of the research questions as appeared earlier in this paper.

5.1 Interactional Modifications in CMC and Classroom Environments

The first research question targeted the type and frequency of interactional modifications in the CMC environment versus those in the class environment. Synchronous online interaction did provide NNSs many opportunities to negotiate meaning using a variety of interactional

modifications. According to the percentage of each interactional modification presented in Figure 1, the participants engaged in online negotiation employed a much greater variety of interactional modifications in comparison with the classroom interaction.

In the CMC environment, 12 types of interactional modifications occurred among which *clarification request* (25%), *confirmation check* (15%), *overt indication of understanding* (14%), *use of keyboard symbols* (12%) and *self repetition/paraphrase* (11%) were the most frequently used modifications for negotiation. However, just 3 types of interactional modifications occurred in the class environment. *Clarification request* (78%) was observed to be the most frequent, followed by *confirmation check* and *self repetition/paraphrase* (11%).

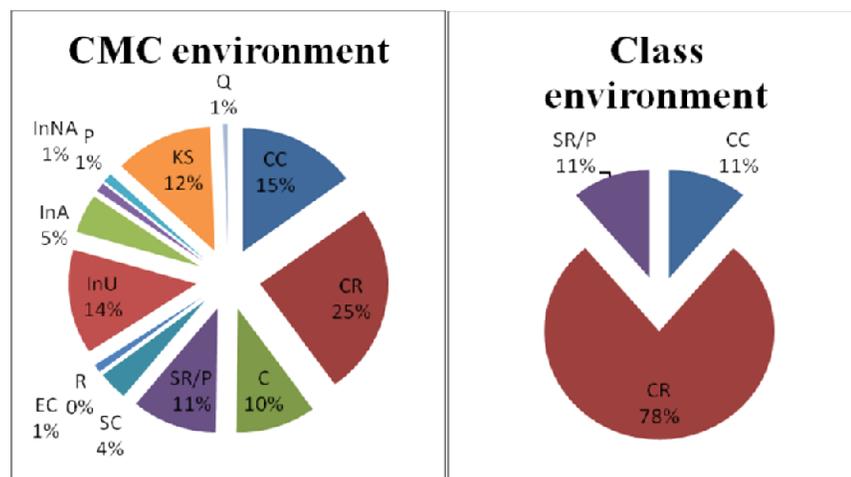


Figure 1: Percentage of each interactional modification in CMC and class environments

Note. CC= confirmation check; CR= clarification request; C= comprehension check; SR/P= self repetition or paraphrase; SC= self correction; R= recast; EC= explicit correction; In U= overt indication of understanding; In A= overt indication of agreement; In NA= overt indication of non-agreement; P= use of Persian; KS= use of keyboard symbols; Q= question

The following unedited example shows how the participants during the online negotiation process used *clarification request* and *comprehension check* in order to resolve the communicative problem.

Student A: where is the quilt?

Student B: what do you mean by quilt? [**Clarification request**]

Student B: I don't understand.

Student A: it is the bed covering with soft material in it

Student A: got it? [**Comprehension check**]

Student B: yes. It is under the rug.

The example above shows that not only did the participants use a variety of interactional modifications in order to understand and to be understood in the negotiation process but it also reveals that they collaborated and cooperated with each other to complete the communicative task.

5.2 Question Development in CMC and Class Environments

For the second research question which addressed the relationship between group membership (CMC environment vs. class environment) and the production and development of question forms in English as a foreign language, we found a total of 1915 questions, out of which 1667 were correct (952 questions in the CMC environment and 715 questions in the class environment). Table 5 presents the raw number of correct questions and erroneous questions in CMC and class environment.

Table 5: Number of correct and erroneous questions in CMC and class environments

	Number of correct questions	Number of erroneous questions	Total
CMC	952	173	1125
Class	715	75	790

5.2.1 Accuracy Point of View

From the accuracy point of view, a one-way repeated measures ANOVA was conducted to compare scores on the accuracy (the ratio of each participant's number of well-formed questions to the total number of questions he or she produced) at Time 1 (pretest), Time 2 (posttest) and Time 3 (delayed posttest). The mean (\bar{X}), standard deviation (S_x) and their multivariate tests are presented in Table 6.

Table 6: Mean of accuracy-based scores and multivariate tests in CMC and class environments

Group	Period	Mean (\bar{X})	Standard Deviation (S_x)	Multivariate Tests					
				Value (Wilks' Lambda)	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
CMC enviro nment (N=18)	Time 1	76.42	14.79						
	Time 2	81.49	14.47						
	Time 3	89.12	13.89	.674	3.865 ^a	2.00	16.00	.043	.326
Class enviro nment (N=18)	Time 1	81.60	12.89						
	Time 2	85.90	17.21						
	Time 3	89.96	12.69	.671	3.920 ^a	2.00	16.00	.041	.329

As can be seen in Table 6, there was a significant effect for time in the CMC environment [Wilk's Lambda=. 67, $F(2, 16) = 3.86$, $p < .05$, multivariate partial eta squared=.33]. A similar result for the class environment was obtained [Wilk's Lambda=. 67, $F(2, 16) = 3.92$, $p < .05$, multivariate partial eta squared=.33]. The results from the repeated measures indicate that despite the significant difference in both environments regarding the three sets of accuracy-based scores in pretest, posttest and delayed posttest, both environments seem to have been able to promote the noticing of problematic linguistic structures and thus were beneficial to the development of grammatical competence. Figure 2 represents this similarity graphically.

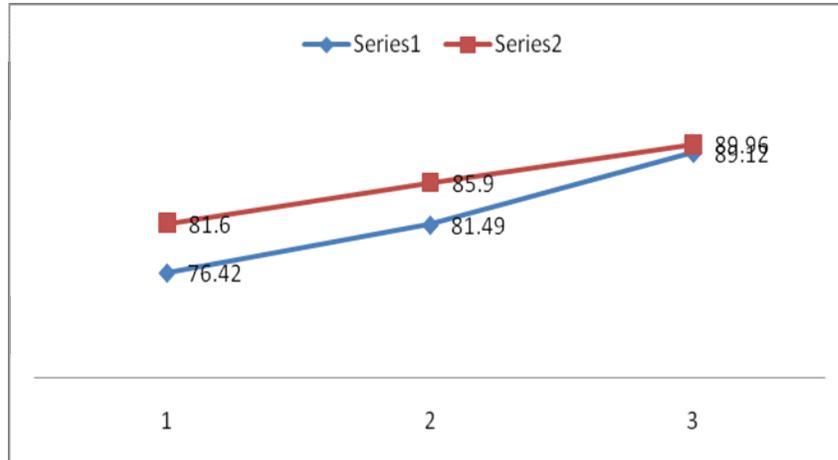


Figure 2: Comparison of well-formed questions in CMC and class environments

5.2.2 Observed Developmental Stages in the Questions Formed in CMC and Class Environments

Learners who engaged in negotiation process in the CMC environment showed a greater increase in the production of developmentally more advanced questions than learners who participated in face-to-face interaction. To be exact, Figure 3 illustrates that the overall frequency of all the questions in both environments revealed that the CMC environment generated all stages of questions, as specified by Pienemann et al. (1988).

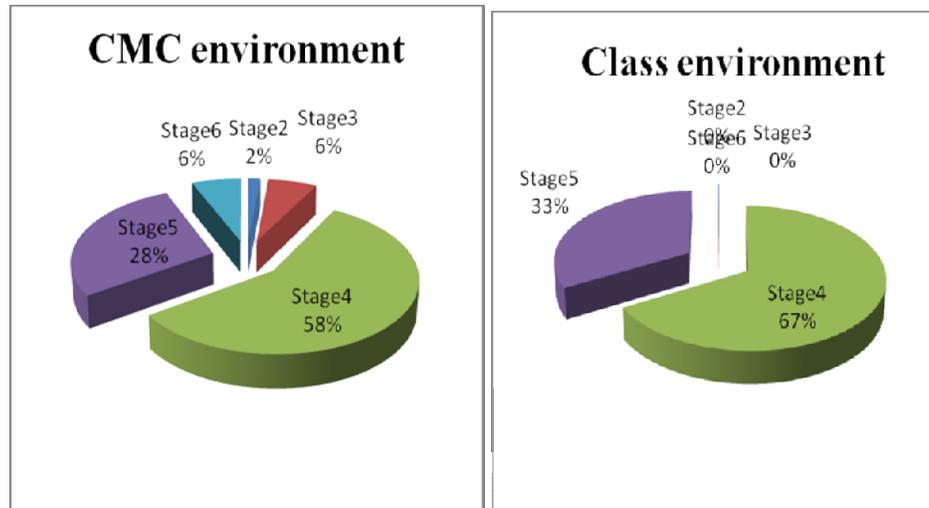


Figure 3: Percentage of questions in different stages in CMC and class environments

As Figure 3 indicates, questions in stage 4 were generated most frequently (58%), followed by stage 5 questions (28%), stage 3 questions (6%), stage 6 questions (6%) and finally stage 2 questions (2%). However, the class environment generated just 2 stages of questions: stage 4 questions (67%) were generated most frequently followed by stage 5 questions (33%).

As for the differences in the developmental stages of the questions generated in pretest, posttest and delayed posttest, a look at Table 7 shows that the majority of students in both CMC and class environments were in stage 5. In the CMC environment, of the 4 students who were in stage 4 during the pretest, 3(17%) progressed to stage 5, and of 13 students who were in stage 5, 2(11%) went up to stage 6, 9(50%) stayed in stage 5, and 2(11%) went down one stage during posttest. However, in the class environment, of the 13 students who were in stage 5 during the pretest, no students progressed to stage 6, although 12 (67%) remained in stage 5 during the posttest. During the delayed posttest, in the CMC environment, totally, 9 (50% students) progressed: 4(22%) from stage 4 to stage 5 and 4(22%) from stage 5 to stage 6 and 1(6%) from stage 2 to stage 4, although 9(50 %) stayed in stage 5. Nevertheless in the class environment, only 3(17%) students made progress from stage 4 to stage 5 and majority of the participants (67%) stayed in the same stage as was assigned during

the pretest: 3(17%) students stayed in stage 4 together with 9(50%) students staying in stage 5. According to the data from this study, it seemed that the participants in the CMC environment outperformed those in the class environment in generating more advanced questions.

Table 7: Developmental stages in pretest, posttest and delayed posttest in CMC and class environments

	Pretest stage	Number of students	Posttest stage			Delayed posttest stage		
			Up one stage	No change	Down one stage	Up one stage	No change	Down one stage
CMC	2	1	1a (6%)	0	0	1b (6%)	0	0
	3	0	0	0	0	0	0	0
	4	4	3 (17%)	1(6%)	0	4 (22%)	0	0
	5	13	2 (11%)	9 (50%)	2 (11%)	4 (22%)	9 (50%)	0
Class	2	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0
	4	5	4 (22%)	1(6%)	0	3(17%)	3(17%)	0
	5	13	0	12 (67%)	1 (6%)	0	9(50%)	3(17%)

a= one student (of 18) went up three stages, from stage 2 to stage 5.

b= one student (of 18) went up two stages, from stage 2 to stage 4.

Finally, to statistically determine whether there was a significant relationship between group membership (CMC versus Class environment) and development in question formation, a Chi-square test for independence was conducted (See Tables 8 & 9).

Table 8: Type of environment * developmental stage cross tabulation

		Developmental Stage		Total
		Not Developed	Developed	
Type of environment	CMC	7	11	18
	Class	14	4	18
		21	15	36

Table 9: Chi-Square tests					
	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.600 ^a	1	.018		
Continuity Correction ^b	4.114	1	.043		
Likelihood Ratio	5.776	1	.016		
Fisher's Exact Test				.041	.020
Linear-by-Linear Association	5.444	1	.020		
N of Valid Cases ^b	36				
a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.50.					
b. Computed only for a 2x2 table					

Chi-square results (Continuity Correction=4.11, $P < .05$) showed that the CMC environment generated more developmentally advanced questions than did the class environment. In addition, the phi coefficient ($=.39$) in Table 10 shows that the association between the group membership and improvement in question formation was fairly strong.

Table 10: Symmetric measures			
		Value	Approx. Sig.
Nominal by Nominal	Phi	-.394	.018
	Cramer's V	.394	.018
N of Valid Cases		36	

In conclusion, the results of this study indicated that the learners who participated in the CMC environment and used a variety of interactional modifications produced a number of questions that were developmentally more advanced than the questions produced by the participants in the class environment.

6. Discussion

The overall aim of this research was to advance an understanding of the potential of task based computer mediated communication to facilitate second language development (Here specifically, the development of question forms), particularly in relation to the role of interactional modifications during online chatting.

With regard to the effectiveness of CMC technology in generating interactional modifications, the results of this study supported the findings in literature and confirmed the potentials of CMC medium in providing a conducive learning environment for interactional modifications to occur. However, a comparison of the type and frequency of the interactional modifications in the two CMC and Classroom environments indicated a significant difference. This difference may, as Salaberry (2000, p.9) suggested, be due to the “inherent characteristics of the discourse of text-based CMC (e.g. written mode of communication, absence of paralinguistic and nonverbal information)” which put more pressure on people to “find the right words” than does engagement in face-to-face discourse. Similarly, Kötter (2003) maintained that “Unlike spoken discourse, where pitch, smiles, laughter and other cues are often employed sub-consciously, people engaged in written CMC must put all their ideas and actions into words if they want to share them with their partners”(p. 148). Although we tried to control for this factor by asking the students in the control group to exercise written rather than oral interaction, the mere presence of both interlocutors in close proximity is a factor which might bring in the paralinguistic and nonverbal information handy. Moreover, the sufficient time during online communication made it possible for the participants to collaboratively produce more interactional modifications. These findings confirm the research by Warschauer (1997), which claims that CMC facilitates collaborative learning.

As for question two which investigated the development of the question forms as produced in the two environments, the findings of this study with regard to accuracy, support Blake (2000) that carefully designed tasks are able to encourage learners’ meaning negotiation ; however, unlike the findings reported by Sotillo (2000) and Lee (2001, 2002), this study revealed that online negotiated interaction (under special conditions) is able to promote accuracy as well, which might have been, as Lee (2001) suggested in her study, because of the prompts and the advice the participants received to be more careful and to pay more attention to

writing accurately while negotiating meaning in the CMC environment. In addition, despite the fact that the same communicative tasks were administered to both groups, the CMC environment encourages the production of a greater number of questions than did the class environment. This was not a surprising observation though, because due to the CMC medium-specific characteristics, such as the *absence of nonverbal cues* together with the *absence of time limitation*, learners would naturally feel more obliged to turn to language in the production of questions yielding a difference in the language production of the two groups.

Finally, the results indicated that in addition to the aforementioned differences, the quality of the questions in the two environments was not the same. In other words, the participants in the CMC environment produced more developed questions as classified by Pienemann et al. (1988). Although this was a valuable finding in its own right, unfortunately there is no work in literature tackling this. Thus, more studies to address this issue are yet required.

7. Conclusion

Based on findings of this study, we can conclude that Iranian EFL learners engaged in negotiation processes through SCMC were able to carry out a variety of communicative tasks cooperatively in the target language outside the classroom. In addition, the participants employed diverse interactional modifications to solve the communication problems they confronted in their interaction. Moreover, as the analysis of the data revealed under special conditions (when teacher indirectly directs the students to pay special attention to the grammaticality of their sentences), online negotiation is able to enhance accuracy as well.

Hence, the findings of this study, like several other investigations suggest that despite the apparent variation in the focus of CMC driven studies, CMC can promise the best results if fluency, the essence of natural interaction is not violated and sacrificed for accuracy by teachers' intervention. Yet, considering the novelty of CMC technology, although it has shown to provide a very enjoyable and fruitful learning environment for EFL learners, we are not sure if it can continue to do so after the novelty disappears. Thus, until such evidence is provided, it would be safe

if we looked at it as a supplement and not as a replacement to classroom instruction and interaction.

In conclusion, based on the results of this study, we strongly suggest that this technology be incorporated into ELT syllabi because it can certainly tackle some of the greatest challenges in foreign language education such as lack of sufficient practice time in the classroom and lack of exposure to the target language outside of the classroom. However, more research is needed in order to shed light on the significance of its contribution to the betterment of the other aspects of the foreign language education.

References

- Beauvois, M. H. (1998). Conversations in slow motion: Computer-mediated communication in the foreign language classroom. *Canadian Modern Language Review/La Revue Canadienne des Langues Vivantes*, 54(2), 198-217.
- Blake, R. J. (2000). Computer mediated communication: A window on L2 Spanish interlanguage. *Language Learning and Technology*, 4(1), 120-136.
- Campbell, A.P. (2004). Using LiveJournal for authentic communication in EFL classes. *The Internet TESL Journal*, 10(9). Retrieved December 17, 2010 from <http://iteslj.org/Techniques/Campbell-LiveJournal/>
- Chapelle, C. A. (2001). *Computer applications in second language acquisition*. Cambridge: Cambridge University Press.
- Fiori, M. L. (2005). The development of grammatical competence through synchronous computer-mediated communication. *CALICO Journal*, 22(3), 567-602.
- Gass, S. M., & Varonis, E. M. (1994). Input, interaction, and second language production. *Studies in Second Language Acquisition*, 16, 283-302.
- Gass, S., & Varonis, E. (1989). Incorporated repairs in nonnative discourse. In M. Eisenstein (Ed.), *The dynamic interlanguage: Empirical studies in second language variation* (pp. 71-86). New York: Plenum Press.
- Gass, S.M. (1997). *Input, interaction and the second Language Learner*. Mahwah, NJ: Lawrence Erlbaum.

- Isharyanti, N. (2008). Interactional modifications in internet chatting. In R.C.V. Marriott and P.L. Torres (Eds.), *Handbook of research on e-learning methodologies for language acquisition* (pp. 271-290). New York: Information Science Reference.
- Jepson, K. (2005). Conversations and negotiated interaction in text and voice chat rooms. *Language Learning & Technology*, 9(3), 79-98.
- Kö tter, M. (2003). Negotiation of meaning and code switching in online tandems. *Language Learning & Technology*, 7(2), 145-172.
- Lee, L. (2001). Online interaction: Negotiation of meaning and strategies used among learners of Spanish. *ReCALL*, 13, 232-244.
- Lee, L. (2002). Synchronous online exchanges: A study of modification devices on non-native discourse. *System*, 30(3), 275-288.
- Long, M. (1985). Input and second language acquisition theory. In S. Gass & C. Madden (Eds.), *Input in second language acquisition* (pp. 377-393). Rowley, MA: Newbury House.
- Mackey, A. (1999). Input, interaction and second language development: An empirical study of question formation in ESL. *Studies in Second Language Acquisition*, 21, 557-587.
- Mackey, A., & Philp, J. (1998). Conversational interaction and second language development: Recasts, responses, and red herrings? *Modern Language Journal*, 82, 338-356.
- Pellettieri, J. (2000). Negotiation in cyberspace: The role of chatting in the development of grammatical competence. In M. Warschauer & R. Kern (Eds.), *Network-based language teaching: Concepts and practice* (pp. 59-86). Cambridge: Cambridge University Press.
- Peterson, M. (2010). Task-based language teaching in network-based CALL: An analysis of research on learner interaction in synchronous CMC. In M. Thomas & H. Reinders (Eds.), *Task-based language learning and teaching with technology* (pp. 41-82). New York: Continuum.
- Pica, T. (1994). Research on negotiation: What does it reveal about second-language learning conditions, processes, and outcomes? *Language Learning*, 44(3), 493-527.
- Pica, T., Kanagy, R., & Falodun, J. (1993). Choosing and using communication tasks for second language instruction. In G. Crookes & S. Gass (Eds.), *Tasks and language learning: Integrating theory and practice* (pp. 9-34). Clevedon: Multilingual Matters.
- Pica, T., Young, R., & Doughty, C. (1987). The impact of interaction on comprehension. *TESOL Quarterly*, 21, 737-758.

- Pienemann, M., & Johnston, M. (1987). Factors influencing the development of language proficiency, In D. Nunan (Ed.), *Applying second language acquisition research* (pp. 45-141). Adelaide, Australia: National Curriculum Resource Centre, AMEP.
- Pienemann, M., Johnston, M., & Brindley, G. (1988). Constructing an acquisition-based procedure for second language assessment. *Studies in Second Language Acquisition*, 10, 217-243.
- Salaberry, R. (2000). L2 morphosyntactic development in text-based computer-mediated communication. *Computer Assisted Language Learning*, 13(1), 5-27.
- Schmidt, R. (1990). The role of consciousness in second language acquisition. *Applied Linguistics*, 11, 219-258.
- Sotillo, S. M. (2000). Discourse functions and syntactic complexity in synchronous and synchronous communication. *Language Learning and Technology*, 4(1), 82-119.
- Spada, N., & Lightbown, P. (1993). Instruction and the development of questions in L2 classrooms, *Studies in Second Language Acquisition*, 15, 205-224.
- Warschauer, M. (1997). Computer mediated collaborative learning: Theory and practice. *The Modern Language Journal*, 81, 470-481.
- Warschauer, M., & Healey, D. (1998). Computers and language learning: An overview. *Language Teaching*, 31, 57-71.

(Appendix A: Sample task)

Spot the differences
The camera never lies

Student A



Study the photograph and then talk to your partner who has a very similar photo but one that was taken at a slightly different time. It is not, therefore, exactly the same.

Work together to find as many differences between the two photos as you can.

✂

Spot the differences
The camera never lies

Student B



Study the photograph and then talk to your partner who has a very similar photo but one that was taken at a slightly different time. It is not, therefore, exactly the same.

Work together to find as many differences between the two photos as you can.

64 **Photocopiable** From *Fun with Words 2* © Penguin Books 2002

(Appendix B: contract form)

Student /Teacher Contract

I,, agree to perform the following tasks to the best of my ability:

- To solve a series of tasks using a synchronous chat program. (Yahoo messenger)
- To save and send all the written transaction to my teacher's e-mail.

And my English teacher guarantees that I will receive the following rewards if I accomplish the above tasks.

A DVD pack including the following items:

- Oxford Picture Dictionary.(Interactive CD Rom)
- Clear Speech(Book+ audio files)
- Speak English Like an American (Book +Audio files)
- Test Your English Vocabulary in Use Upper- Intermediate (Book)

Date Signed:.....

Student Signature:.....

Teacher Signature:.....

(Appendix C: parental consent form)

فرم مربوط به ولی زبان آموز

اینجانب ولی زبان آموز..... بدین وسیله اعلام می دارم با شرکت
فرزندم در پروژه تحقیقی- تحت عنوان تاثیر کامپیوتر در فرایند زبان آموزی- که از طرف آموزشگاه
علامه طباطبایی توسط مدرس مربوطه ترتیب داده شده است موافقم

نام و نام خانوادگی

امضای ولی زبان آموز

تاریخ