

Quantitative study comparing network-based language teaching (NBTL) to traditional Spanish classes

Estudio cuantitativo en el que se comparan la enseñanza de la lengua basada en la red (NBTL) y las clases de español tradicionales

DOI: 10.4438/1988-592X-RE-2013-EXT-242

Isabel Moreno-Lopez
Citlali Miranda-Aldaco

Goucher College. Department of Hispanic Languages, Literatures and Cultures. Baltimore, United States.

Abstract

Most language teachers, even the self-proclaimed technologically challenged, use some kind of technology in their classrooms. During the last decade, studies on the use of technology for communication purposes or synchronous and asynchronous computer-mediated communication (CMC) technology have proliferated around the globe. CMC technology has allowed native speakers of the target language into the second language (SL) classroom, transforming it into a real-world context environment. The objective of the study, informed by the information processing approach and the interaction hypothesis, is to compare traditional SL classes to network-based language teaching (NBTL) classes in order to assess whether the use of synchronous and asynchronous CMC technology in NBTL courses enhances language acquisition in the Spanish language class. It also aims to gather quantitative results in a discipline that is overwhelmingly informed by qualitative data. The researchers used the reading and listening sections of the Minnesota Language Proficiency Assessments (MLPA) as pre- and posttest, and analyzed data using a mixed model analysis of variance. From 2008 to 2010, researchers designed the procedures and guidelines to conduct this study. Results from the Spring semester

2011 show that CMC technology plays an important role in students' language learning given that reading and listening scores were significantly higher in the posttest in the NBLT classes compared to the traditional classes. The analysis of the results obtained in this study open new possibilities to further investigate the use of CMC technology in SL teaching-learning.

Key words: computer mediated communication, CMC, technology, NBLT, Spanish, chats, MLPA, ANOVA.

Resumen

La mayoría de los profesores, incluso los que se consideran tecnológicamente analfabetos, usan algún tipo de tecnología en sus clases. Durante la última década, los estudios sobre el uso de la tecnología con fines comunicativos y la comunicación mediada por ordenador (CMC) –síncrona y asíncrona– han proliferado en todo el mundo. La CMC ha permitido que en las clases de lenguas extranjeras se introduzcan hablantes nativos del idioma y las transformen hacia un contexto presencial. El objetivo de este estudio, basado en el enfoque de procesamiento de la información y la hipótesis de la interacción, es comparar clases de lengua extranjera tradicionales con clases que usan la enseñanza de la lengua basada en la red (NBLT) para evaluar si el uso de la CMC síncrona y asíncrona en aulas que emplean NBLT mejora la adquisición de la lengua española como lengua extranjera. Este trabajo también tiene como objetivo recopilar resultados cuantitativos en una disciplina en la que hay muchos más estudios cualitativos que cuantitativos. Las investigadoras utilizaron como pruebas preliminares y posteriores las secciones de lectura y de comprensión oral de las evaluaciones MLPA (Minnesota Language Proficiency Assessments) y analizaron los datos mediante un modelo mixto de análisis de varianza. Entre 2008 y 2010, las investigadoras desarrollaron los procedimientos para llevar a cabo este estudio. En la primavera del 2011 se compararon los dos tipos de enseñanza. Se observó que la CMC desempeña un papel importante en el aprendizaje de una lengua, ya que los resultados de lectura y comprensión oral fueron significativamente más altos en la prueba posterior a la enseñanza con NBLT que en la correspondiente a la enseñanza tradicional. El análisis de los resultados obtenidos en este estudio abre nuevas posibilidades para seguir investigando el uso de la CMC en la enseñanza y aprendizaje de una segunda lengua.

Palabras clave: comunicación mediada por ordenador, CMC, tecnología, NBLT, lengua española, chats, MLPA, análisis de varianza.

Introduction

Most language teachers, even the self-proclaimed technologically challenged, use some kind of technology in their classrooms, either course- management systems (such as Blackboard and WebCT) to distribute syllabi, assignments, grades and so on, or video-sharing websites from which they can quickly download songs, movies and other traditional language resources. However, the biggest advantage that the Internet offers to a language teacher is the possibility of low-cost, easy and direct access to other peoples, languages, and traditions and all the possible related cultural artifacts. This is also known as network-based language teaching (NBLT), and refers to the pedagogical use of computers connected in local or global networks (Van Deuten-Scholl and Hornberger, 2008).

Since the early 1990s, technology has received substantial attention by language practitioners. The use of technology for content delivery provides very practical advantages such as saving paper and grading time, as mechanical activities can be completed online and graded by the computer system. However, it has also proven to be beneficial from a pedagogical point of view. For example, Sagarra and Zapata (2008) compared two elementary Spanish classes, one using a paper workbook and one using an online workbook. They found that in grammar both groups performed similarly after four months; but after eight months, the group using the online workbook performed significantly better in the grammar component.

During the last decade, studies on the use of technology for communication purposes, or synchronous and asynchronous computer- mediated communication (CMC) technology have proliferated around the globe. CMC technology has allowed native speakers of the target language into the second language (SL) classroom, transforming it into a real-world context environment. The objective of the study, informed by the information processing approach

and the interaction hypothesis, is two- fold: First, it compares traditional SL classes to NBLT classes in order to assess whether the use of synchronous and asynchronous CMC technology in NBLT courses enhances language acquisition in the Spanish language class. Second, it aims to gather quantitative results in a discipline that is overwhelmingly informed by qualitative data.

Revista de Educación, Extraordinario 2013, pp. 363-383 365 Fecha de entrada: 17-04-2012 Fecha de aceptación: 21-09-2012

Moreno-López, I. y Miranda-Aldaco, C. QUANTITATIVE STUDY COMPARING NETWORK-BASED LANGUAGE TEACHING (NBLT) TO TRADITIONAL SPANISH CLASSES

Literature review

The researches of this study concur with Reigeluth (1992) in that research on education needs to be pragmatic and eclectic and draw from several theoretical approaches because different views are necessary for explaining different stages of the learning process. As Ritchie and Bhatia (1996) argue, the information processing approach is a process that deals with the way knowledge is acquired. There are two types of processes: controlled and automatic. The controlled process is active, that is, it requires attention from learners, while the automatic process is passive. When learners start acquiring a SL, they use controlled processes of acquisition. «In the process of acquisition, learners shift from concrete, novice processing to more abstract, expert style by restructuring their representations of the relevant processes» (Ritchie and Bhatia, 1996, p. 13).

In the interaction hypothesis, environment plays a role in the acquisition of a SL, in which native and non-native speakers of a language also use selective attention (or a controlled process of language acquisition) to negotiate meaning. As Long (1996) explains:

Negotiation of meaning is the process in which, in an effort to communicate, learners and competent speakers provide and interpret signals of their own and their interlocutor's perceived comprehension, thus provoking adjustments to linguistic form, conversational structure, message content, or all three, until an acceptable level of understanding is achieved (p. 418).

The information processing approach and the interaction hypothesis are especially well suited for synchronous and asynchronous CMC activities in NBLT courses, which include, but are not limited to, blogs, podcasts, discussion boards and forums, text-based chats, and oral video conferencing. In these activities, native and non-native speakers practice the target languages and shift from concrete, novice processing to more abstract, expert style by negotiating meaning.

Yanguas (2010) used an interactionist perspective to investigate, among other things, if there were any differences between oral CMC and traditional face-to-face communication. He concluded that the nature of the task, rather than the medium, is responsible for the type and focus of the negotiation. That is, the negotiation routines seem to be very similar in the

366 *Revista de Educación*, Extraordinario 2013, pp. 263-383 Fecha de entrada: 17-04-2012 Fecha de aceptación: 21-09-2012

Moreno-López, I. y Miranda-Aldaco, C. QUANTITATIVE STUDY COMPARING NETWORK-BASED LANGUAGE TEACHING (NBLT) TO TRADITIONAL SPANISH CLASSES

CMC and the face-to-face communication. This finding is significant with respect to the CMC technology research as it shows that an online medium does not hinder the negotiation process in SL communication. In fact, it parallels previous studies, which show that learner-initiated negotiation sequences are a characteristic of chat interactions between native and non-native speakers of a language (Tudini, 2007).

Other studies that focus on specific applications of CMC technology also come to the same conclusions. For example, Lee (2009) explored how students used interactive and collaborative engagement to create blogs and podcasts. She found that when creating blogs and podcasts, native and non-native speakers helped each other to organize and correct their work: «Through collaborative interaction, learners expand their linguistic and cognitive abilities to engage in decision-making and problem-solving (e. g. negotiation of meaning and form)» (p. 428).

Some studies have examined the affective benefits of the CMC technology on

language acquisition and illustrate how CMC enhances student-to-student communication, reducing the use of students' mother tongue and the effects of shyness (Abrams, 2006). Results suggest that CMC technology allows conversation to go at a slower pace giving learners more processing time (Pellettieri, 2000); promotes more self and other initiated corrections (Kitade, 2000); facilitates an equal participation by learners when used with small groups of students (Alvarez-Torres, 2001; Böhlke, 2003), and saves the conversations in such a way that allows easy access during and after the interaction to identify mistakes (Lai and Zhao, 2006).

However CMC technology may also adversely affect not only language acquisition but also students' perception on the efficiency of the technology used. Jauregi and Bañados (2008) reported that, in a study between Dutch and Chilean students, there were complaints that some students did not arrive on time to their scheduled meetings, cancelled sessions without previous notification, and did not respond to emails. The authors suggested that these problems between intercontinental peers might have affected their overall evaluation of the experience. Cultural differences might also have affected the results as the Dutch students reported that it was less threatening to communicate through Breeze (Adobe Connect) while the Chilean students preferred the communication face-to-face over a digital environment.

Revista de Educación, Extraordinario 2013, pp. 363-383 367 Fecha de entrada: 17-04-2012 Fecha de aceptación: 21-09-2012

Moreno-López, I. y Miranda-Aldaco, C. QUANTITATIVE STUDY COMPARING NETWORK-BASED LANGUAGE TEACHING (NBLT) TO TRADITIONAL SPANISH CLASSES

Research question and hypotheses

The research question of this study investigated whether the use of synchronous and asynchronous CMC technology in NBLT courses enhances language acquisition in the novice-intermediate Spanish language class. The researchers used the reading and listening sections of the Minnesota Language Proficiency Assessments (MLPA) as pre- and posttest. Data were analyzed using a mixed model analysis of variance, which was aimed at determining that the NBLT

courses and the traditional courses performed similarly on the pretest, but one group performed significantly different on the posttest.

This research question was investigated with three hypotheses: 1. There will be a significant difference in reading and listening scores from pretest to posttest. 2. There will be a significant difference in reading and listening scores between treatment and control groups. 3. There will be a significant difference in reading and listening from pretest to posttest depending upon group, treatment or control.

Methodology

In the academic year 2008-09, the Spanish program of a small liberal arts college in the United States (US) started a process to assess the learning objectives of the courses at the novice-intermediate level. Language professors implemented the MLPA developed by the Center for Advanced Research on Language Acquisition (CARLA). The MLPA is a proficiency-based second language assessment tool for reading, writing, listening, and speaking designed on the scale outlined by the American Council on the Teaching of Foreign Languages (ACTFL), and accessible through CARLA at the University of Minnesota.

For this study, only the reading and listening sections of the test were used to investigate whether the use of synchronous and asynchronous CMC technology in NBLT courses enhances language acquisition. Pre- and posttests at the beginning and at the end of each semester were mandatory for all novice to intermediate Spanish language students. From the Fall semester 2008 to the Fall semester 2010, the researchers analyzed

368 *Revista de Educación*, Extraordinario 2013, pp. 263-383 Fecha de entrada: 17-04-2012 Fecha de aceptación: 21-09-2012

Moreno-López, I. y Miranda-Aldaco, C. QUANTITATIVE STUDY COMPARING NETWORK-BASED LANGUAGE TEACHING (NBLT) TO TRADITIONAL SPANISH CLASSES

preliminary results, designed procedural guidelines, and implemented changes in order to obtain reliable data that could be used to compare traditional SL

classes to NBLT classes. The results of the MLPA reading and listening assessments gathered in the Spring semester 2011 are presented and discussed in this paper.

Participants

Participants were novice-intermediate undergraduate college students enrolled in second and third semester Spanish courses in the US and intermediate-high undergraduate college students enrolled in English courses in Mexico City. All groups met during 14 weeks. The control groups were language classes that met face-to-face four hours per week. The treatment groups were language classes that met face-to-face three hours per week. During the fourth contact hour online for the treatment classes, US students used synchronous and asynchronous CMC technology to interact with each other and with Spanish native speakers studying English at a university in Mexico City.

Online activities used in the treatment group

All students, both in the US and Mexico, had access to the same course via Blackboard, hosted by the college in the US. During the first month of the semester, students created personal profiles, each group in their target language and conducted asynchronous activities to get to know each other and create community. Then, they read each other's profiles and used the Discussion Board, an asynchronous communication tool, to ask at least three students from the other country follow-up questions on their profiles in order to get to know them better.

For the remaining time of the semester, students were randomly paired (one student from the US and one from Mexico) to conduct one-hour chats every two weeks (30 minutes in Spanish and 30 minutes in English). Students were required to write 275-word reports in the target language on their conversations. Students received grammatical feedback on their reports, and had the possibility of re-writing them for a higher grade. The topics for the Spanish portion of the chats usually related to the grammatical points studied in class and the topic of

the lesson. The topics

Revista de Educación, Extraordinario 2013, pp. 363-383 369 Fecha de entrada: 17-04-2012 Fecha de aceptación: 21-09-2012

Moreno-López, I. y Miranda-Aldaco, C. QUANTITATIVE STUDY COMPARING NETWORK-BASED LANGUAGE TEACHING (NBLT) TO TRADITIONAL SPANISH CLASSES

for the English chats usually related to cultural topics chosen by the Mexican students as a group. The difference in topics was due to the language proficiency of each group, as students could speak of more complex issues in English than in Spanish. In the Spring 2011, a video-conference session was added to the online activities of the treatment group. Students were also required to write a report on their video-conference conversations, which underwent the same feedback process as the written chats.

The sequence of activities chosen for the treatment group required that students moved from controlled to automatic processes of acquiring knowledge. That is, at the beginning of the semester, with individual and asynchronous activities (such as creating their personal profiles and asking questions in the Discussion Board) students used a very concrete processing of information. Later on in the semester, students shifted from novice processing to more abstract, expert style by conducting synchronous conversations with native speakers of the target language and writing reports in which the correctness of their grammar was monitored. Having students transfer from active to passive processes of acquiring knowledge helps them transition from novice to more expert language learners.

Many of the studies on NBLT courses using CMC technology focus on intermediate-high SL students, due the fact that the use of CMC technology requires that learners collaborate with each other to negotiate and create meaning in real-world contexts. However, some language practitioners are hesitant of using CMC technology with novice SL students, as they fear that novice learners do not have enough language proficiency to successfully negotiate meaning in real-world contexts. Researchers have surmounted this issue by pairing students with different SL abilities (Pellettieri, 2000; Tam, Kan

and Ng, 2010). In this study, in the treatment group, novice Spanish students from the US were paired with native language speakers of Spanish from Mexico with an intermediate-high English proficiency. In this way, when practicing English, SL students from Mexico City benefited from the competent native speakers from the US. Furthermore, when practicing Spanish, if communication was interrupted because of a language barrier, students could revert to English to negotiate meaning and resume their interaction. By pairing novice and competent language speakers, students used an interactive approach to negotiate meaning in order to communicate.

370 *Revista de Educación*, Extraordinario 2013, pp. 263-383 Fecha de entrada: 17-04-2012 Fecha de aceptación: 21-09-2012

Moreno-López, I. y Miranda-Aldaco, C. QUANTITATIVE STUDY COMPARING NETWORK-BASED LANGUAGE TEACHING (NBTL) TO TRADITIONAL SPANISH CLASSES

Guidelines and procedures implemented

The researchers designed guidelines and implemented changes that rose from the results gathered from the Fall semester 2008 to the Fall semester 2010, in order to obtain reliable data to analyze in the Spring semester 2011.

At the beginning and the end of the Fall semester 2008, all students attending second semester Spanish courses took the MLPA reading and listening tests. The second semester groups scored similarly on the pretest. At the end of the semester, even though there was improvement in the treatment group from pretest to posttest, results were not statistically significant. Furthermore, the control group's scores were lower in the posttest than in the pretest. The researchers assumed that students did not regress in their language learning, and that this inconsistency might have been due to several technical issues. There was a shortage of computers and insufficient number of headphones in the computer laboratories, which made it difficult to take the tests because there were 19 students enrolled per course, and computer laboratories had only 15 computers. In addition, students and faculty encountered technical issues such as computers freezing, slow Internet connection, and server problems during the test delivery. Students would also forget their password or id, and needed to

create new accounts to conduct the posttest at the end of the semester, thus complicating data analysis. Finally, some students were not able to finish a test due to time constraints and others missed one or both tests (pre- or post-) because they were absent and failed to take the test on their own time.

In the control group, students were told that completion of the pre- and posttests would not affect their final grade. It is also possible that due to this, at the end of the semester, students did not take the time nor put the effort in completing the test.

In order to solve the technical issues that had arisen in the Fall semester 2008, researchers decided to implement the following changes in future semesters: to get better acquainted with tests; have the Assessment Coordinator (one of the researchers) be 'on-call' during the class time when students were taking the tests to solve any issues that faculty and students would encounter; ask students to bring their laptops and headphones to class to complete the test; remind students to have a specific web browser installed in their computers to prevent them from

Revista de Educación, Extraordinario 2013, pp. 363-383 371 Fecha de entrada: 17-04-2012 Fecha de aceptación: 21-09-2012

Moreno-López, I. y Miranda-Aldaco, C. QUANTITATIVE STUDY COMPARING NETWORK-BASED LANGUAGE TEACHING (NBTL) TO TRADITIONAL SPANISH CLASSES

freezing; create an instruction guide for faculty and students; and give students credit for taking the pre- and posttests to encourage motivation. During the Spring 2010 semester, all students attending third semester

Spanish courses took the MLPA reading and listening tests. The third semester groups scored similarly on the pretest. At the end of the semester, the treatment group scored higher than the control group approaching significance and showing enhanced performance. Posttest session results were still inconclusive as results of the posttest of the control group were, again, lower compared to the results of the pretest, as had happened during the Fall 2008 semester. The researchers analyzed the procedure used to deliver the tests and found many differences among groups. The treatment group took the test in class, while the

control group was assigned the test as homework as not to lose class time for content delivery. Students from the control group were given an incentive of two points towards their final grade (out of 100), while the treatment group did not receive any incentive, and the test did not count towards their final grade.

Regarding the listening test, results were not statistically significant either and both groups showed a decrease in the scores from pretest to posttest. The treatment group took the listening test and the reading test during class on the same day, and since some students did not bring their headphones and had to share them, they had less time to spend in this section. The control group took the listening test on their own time.

In order to solve the procedural issues that had arisen, researchers decided that both groups would take the posttest in class, and that students had to be actively reminded to bring their headphones to class to take the listening section of the test.

During the Fall semester 2010, the MLPA reading and listening assessments were distributed to 67 students in second semester Spanish courses (34 students in the treatment group and 33 students in the control group), and to 55 students in third semester Spanish courses (17 students in the treatment group and 38 students in the control group). In the different groups, there were students who failed to complete the pre- or postassessment and were not included in the study.

Therefore, only a total of 61 students in second semester took the reading tests, and 54 students took the listening tests. As for third semester, 40 students took the reading tests, and 37 took the listening tests. As so many students had to be eliminated from the study because they had not taken one or both tests, in the Spring 2011, students were asked to give their professors the pretest

372 *Revista de Educación, Extraordinario 2013*, pp. 263-383 Fecha de entrada: 17-04-2012 Fecha de aceptación: 21-09-2012

Moreno-López, I. y Miranda-Aldaco, C. QUANTITATIVE STUDY COMPARING NETWORK-BASED LANGUAGE TEACHING (NBTL) TO TRADITIONAL SPANISH CLASSES

scores to ensure completion of the test. At the end of the semester, professors

told students that their pretest scores were ‘the number to beat’. Following are the results of the MLPA reading and listening assessments for the Spring 2011 for second and third semester Spanish students, after implementing the technical changes and procedural guidelines designed in previous academic years.

Results and discussion

During the Spring semester 2011, a video-conference session was added to the online activities of the treatment group in order to compare improvement in listening skills of SL students. Second and third semester students took the pre- and posttests of reading and listening.

Second semester courses

For second semester classes, 27 students in the control group and 22 students in the treatment group completed the reading assessment. As for the listening assessment, 20 students in the control group and 15 students in the treatment group completed both pre- and post-. For third semester students, 24 in the control group and 14 in the treatment group completed both pre- and postassessments in reading. In listening, 22 students in the control group and 11 students in the treatment group finished both pre- and postassessments.

Table I shows the results of means and standard deviations for the second semester reading. Results of the mixed model ANOVA for the second semester classes indicated significant effects in reading across time $F(1,47) = 28,77; p < ,001$.

Revista de Educación, Extraordinario 2013, pp. 363-383 373 Fecha de entrada: 17-04-2012 Fecha de aceptación: 21-09-2012

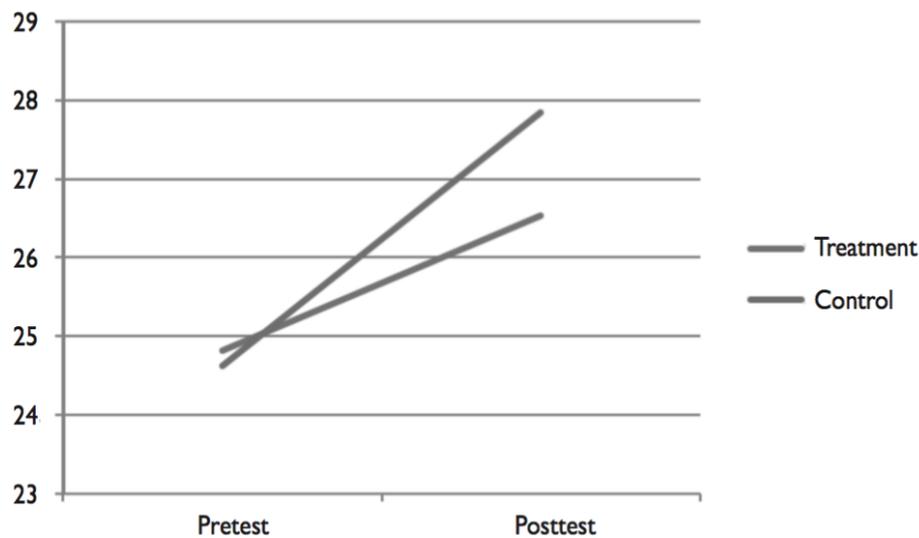
Moreno-López, I. y Miranda-Aldaco, C. QUANTITATIVE STUDY COMPARING NETWORK-BASED LANGUAGE TEACHING (NBTL) TO TRADITIONAL SPANISH CLASSES

TABLE I. Means and standard deviations of reading scores, reported by group and reading, second semester

READING			
Group	Pretest	Posttest	Total
	M (SD)	M (SD)	M (SE)
Treatment	24,82 (4,00)	26,55 (3,99)	25,68 (0,99)
Control	24,63 (5,92)	27,85 (5,14)	26,24 (0,89)
Total	24,71 (5,10)	27,27 (4,66)	25,96 (0,67)

As can be observed in Figure 1, both the treatment and control groups' posttest scores were significantly higher than the pretest showing that all groups improved throughout the semester. This may mean that both groups developed their reading skill similarly.

FIGURE I. Plot of mixed model anova, interaction of reading by group, second semester, Spring 2011



In the listening assessment for second semester, results of the mixed model ANOVA indicated significant effects in listening across time only for the treatment group $F(1,33) = 27,06; p < ,001$. Table II shows results for means and standard deviations for the second semester listening.

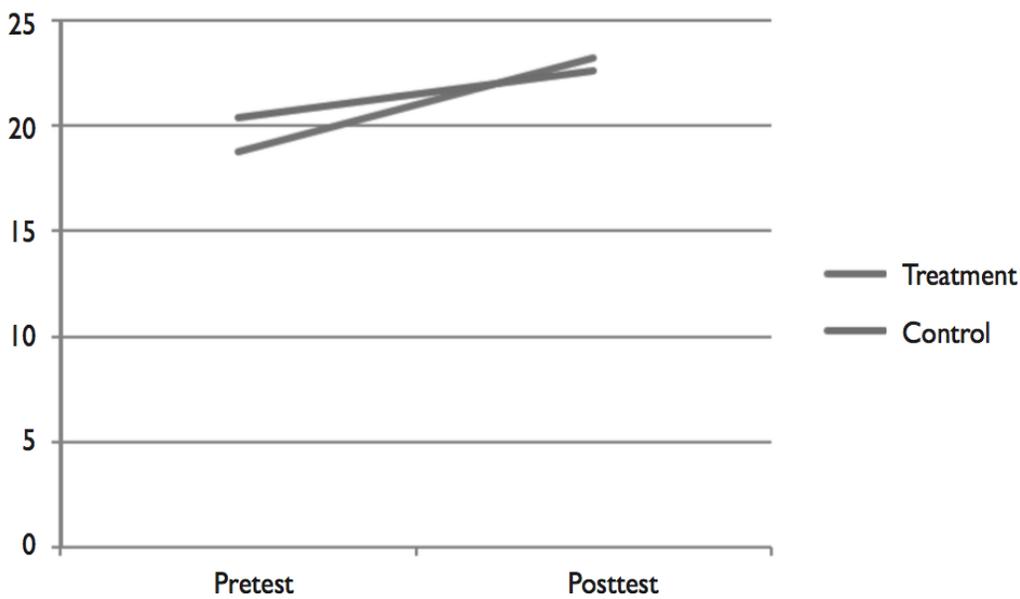
TABLE II. means and standard deviations of listening scores, reported by group and listening, second semester

LISTENING			
Group	Pretest	Posttest	Total
	M (SD)	M (SD)	M (SE)
Treatment	18,8 (6,01)	23,27 (5,74)	21,03 (1,56)
Control	20,4 (6,94)	22,65 (6,40)	21,52 (1,35)
Total	19,71 (6,52)	22,91 (6,04)	21,28 (1,03)

Figure II shows that the treatment group results are significantly higher than the control group results in listening. As a video-conference activity had been added to the treatment group, it is possible that this tool helped students enhance their listening skill. The treatment group obtained lower results in the pretest

compared to the results of the control group. That is, the listening skill of the treatment group was weaker at the beginning of the semester than the one of the control group. However, at the time of the posttest, the treatment group increased its scores more than the control group making this difference from pretest to posttest a statistically significant one. Thus, the treatment group strengthened this skill more throughout the semester showing that CMC does indeed facilitate learning.

FIGURE II. Plot of mixed model anova, interaction of listening by group, second semester, Spring 2011



Third semester courses

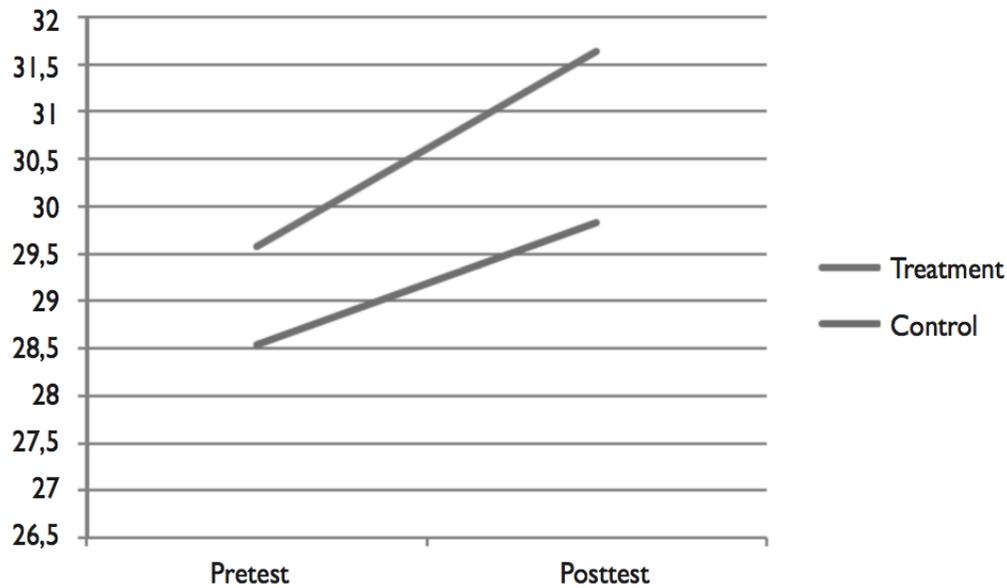
Third semester results of the mixed model ANOVA indicated significant effects in reading across time for the treatment group, $F(1,36) = 11,69; p < ,01$. Table III shows the results of means and standard deviations for the third semester reading.

TABLE III. Means and standard deviations of reading scores, reported by group and reading, third semester

READING			
Group	Pretest	Posttest	Total
	M (SD)	M (SD)	M (SE)
Treatment	29,57 (3,6)	31,64 (2,98)	30,61 (1,40)
Control	28,54 (6,3)	29,83 (6,33)	29,19 (1,07)
Total	28,92 (5,46)	30,50 (5,37)	29,90 (0,88)

As can be seen in Figure III, *post hoc* analyses showed that the third semester treatment group's posttest scores were significantly higher than the control group in reading. The treatment group started the semester with higher scores in the pretest compared to the control group, and continued to improve throughout the semester. The improvement obtained by the control group barely reached the results obtained in the pretest of the treatment group.

FIGURE III. Plot of mixed model anova, interaction of reading by group, third semester, Spring 2011



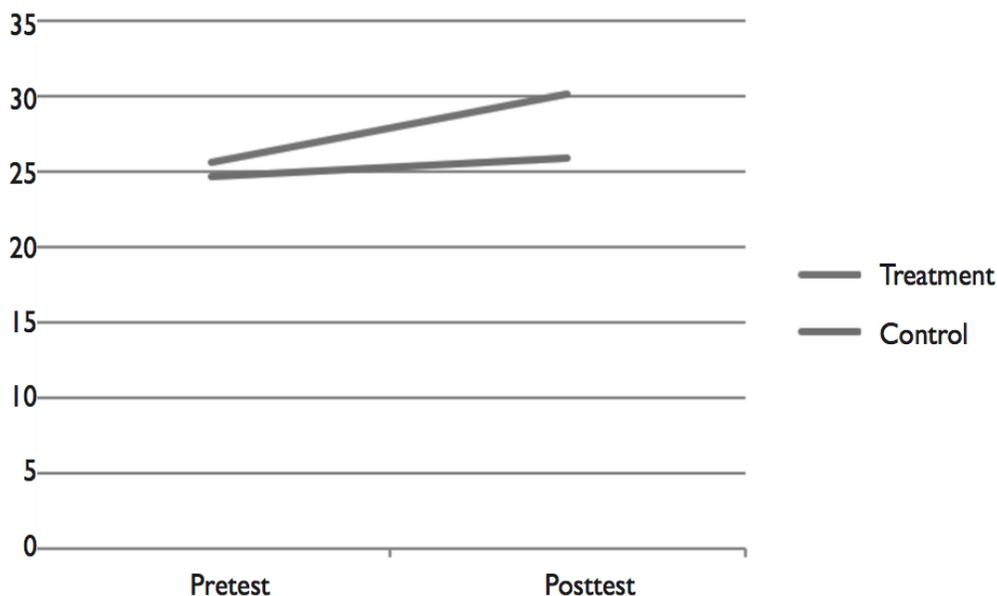
Third semester listening results of the mixed model ANOVA indicated a significant interaction of listening by group, $F(1,31) = 6,81$; $p < ,05$. This means that there is a statistically significant difference between the treatment group and the control group from pretest to posttest and by type of group. Table IV shows means and standard deviations of listening scores for the third semester groups.

TABLE IV. Means and standard deviations of listening scores, reported by group and listening, third semester

READING			
Group	Pretest	Posttest	Total
	M (SD)	M (SD)	M (SE)
Treatment	25,64 (3,93)	30,18 (3,45)	27,90 (1,57)
Control	24,64 (5,9)	25,94 (7,42)	24,22 (1,1)
Total	24,97 (5,28)	25,94 (7,01)	26,06 (0,96)

Figure IV shows that treatment group's results were significantly higher than control group's results in listening, and by group. Again, this shows that the video-conference activity that was added to the treatment group helped students enhance their listening skill. It is yet to determine why the scores of the control group were lower in the posttest than in the pretest in order to take the appropriate pedagogical measures.

FIGURE IV. Plot of mixed model anova, interaction of listening by group, third semester, Spring 2011



Conclusions and implications for future research

When comparing the two types of classes, traditional SL classes to NBLT classes, during the Fall 2008, results were inconclusive and difficult to interpret. It was observed that the treatment group scores were higher than the control group scores, though not significant; and that the control group obtained lower results in the posttest in comparison to the pretest. The researchers assumed that students were not regressing in their language learning, and that these outcomes must have been due to the technological obstacles that participants were encountering.

During the Spring and Fall 2009, several modifications were made in order to obtain more reliable data that could be used to compare traditional SL classes to NBLT classes. As part of the improvements regarding technology, one of the researchers was assigned to be ‘on-call’ while students were taking the tests in order to solve problems in situ, and students were asked to download specific web browsers to prevent computers from freezing and to bring their own computers and headphones to class.

In the Spring 2010, there was no significant difference between pre- and posttests in reading although students in the treatment group did improve their performance approaching significance. Scores in the control group were lower again in the posttest. It became evident that differences in procedures were accounting for these results, as the control group was assigned the tests as homework and were given credit for taking it, while the treatment group was taking the tests in class, and were not given any credit for it. The researchers realized that some teachers were assigning the tests for homework because administering the tests during class-time took away at least two class sessions otherwise dedicated to content delivery. In order not to lose this important class time, the final exam was moved to exam week and the posttest was used as practice for the final.

As so many students had to be eliminated from the study during the Fall semester 2010 because they had not taken one or both tests, in the Spring 2011, students were asked to give their professors the pretest scores to ensure completion of the test. At the end of the semester, professors told students that their pretest scores were ‘the number to beat’.

During the Spring 2011, after technical issues were solved and procedural modifications were made, all students, in second and third semester courses, scored higher in the reading posttest than in the pretest. However, the third semester treatment group’s posttest scores were significantly higher than the control group in reading, which supports the research question that the use of CMC technology in NBLT courses enhances language acquisition in the Spanish

language classroom.

These results show that the learning environment of the NBLT courses plays an important role in students' scores because reading results were significantly higher in the posttest. Students in the treatment group were using the acquired knowledge in an active way while negotiating meaning in the online activities when interacting with their Mexican counterparts.

Regarding listening, preliminary results in the Fall 2008 were also inconclusive. Treatment and control groups improved significantly from pretest to posttest, which was no surprise, as the online component of the NBLT courses did not include any oral or listening activities. This reinforced that, because the online activities were text-based, the listening skill was practiced equally in both groups and, therefore, both groups improved similarly. However, in the Spring 2010 semester, student scores in both treatment and control groups were lower in the posttest in comparison to the pretest. Researchers analyzed the possible reasons and concluded that the fact that students kept forgetting their headphones and having to share one pair among several students might have accounted for them rushing through this section and performing poorly. It was agreed that students had to be reminded to bring their headphones to class.

The researchers also decided to add a video-conference activity to the treatment group in order to make better use of the technological advances and to provide students with a more challenging task to practice their speaking and listening skills. This activity would also help to assess if the treatment group scored higher in the listening tests than the control group. Therefore, researchers designed the third chat activity as a video conferencing activity for the Spring 2011 semester in order to contribute to the emerging area of NBLT that uses video conferencing to practice oral skills. This activity would also give students the opportunity to negotiate meaning, acquire new knowledge, and shift from active to passive information processing, allowing researchers to continue to use an interactionist perspective and an information processing approach to investigate the research questions.

Results from this implementation were reflected in the listening MPLA scores of the Spring 2011 semesters. During the Spring 2011, both second and third semester students in the treatment group had a significant improvement from pre- to posttest. Even though there was also improvement in the control group from pretest to posttest, their results were not statistically significant, which supports the research question and hypothesis. Treatment group's results for third semester students were also significantly higher than control group's results in listening, and by group.

Many of the recent studies on oral proficiency yield interesting data, but still call for more studies to corroborate their results. For instance, Payne and Whitney's (2002) study showed a significant improvement in oral proficiency when practicing two of four contact hours per week in chat rooms, and Lee's (2002) study suggested that rapid synchronous exchange could encourage fluency rather than accuracy when students are more focused on the exchange of ideas than on grammatical correctness. However, both Abrams (2003) and Blake's (2008) studies observed no significant difference in the quality of language of groups using synchronous CMC, asynchronous CMC applications and traditional language courses.

The analysis of the results obtained in this study open new possibilities to further investigate the use of CMC technology in SL teaching-learning, such as the creation of a longitudinal study to measure students' language improvement throughout the first three sequential semesters of studying Spanish. It would allow researchers to measure whether students in the treatment group improve more than students in the control group in an eighteen-month timeline.

Finally, it would be interesting to include the use of graphic-based synchronous CMC technology to assess whether the findings corroborate previous research which suggests that learners produce more language when they use graphic CMC technology than when they use text-based CMC applications although there are more instances of off task discourse (Alvarez-Torres, 2001).

Bibliographic references

Abrams, Z. I. (2003). The Effect of Synchronous and Asynchronous CMC on Oral Performance in German. *Modern Language Journal*, 87, 157-167. —

(2006). From Theory to Practice: Intracultural CMC in the L2 Classroom.

CALICO Journal, 5, 181-209. Álvarez-Torres, M. J. (2001). On ‘Chatting’ in the Foreign Language

Classroom. *Clearing House*, 74 (6), 313-316. American Council on the Teaching of Foreign Languages (ACTFL) (2012).

Writing Proficiency Guidelines. Retrieved from [http://www.actfl.org/i4a/](http://www.actfl.org/i4a/pages/index.cfm?pageid=3326)

pages/index.cfm?pageid=3326 Reigeluth, C. M. (1992). Reflections on the Implications of Constructivism

for Educational Technology. In T. M. Duffy and D. H. Jonassen (Eds.),

Constructivism and the Technology of Instruction: A Conversation

(149-156). Mahwah (New Jersey): Lawrence Erlbaum.

Blake, R. J. (2007). New Trends in Using Technology in the Language Curriculum. *Annual Review of Applied Linguistics*, 27, 76-97. Doi: 10.1017/S0267190508070049.

Blake, R., Wilson, N. L., Cetto, M. and Pardo Ballester, C. (2008). Measuring Oral Proficiency in Distance, Face-To-Face and Blended Classrooms. *Language Learning & Technology*, 12 (3), 114-127.

Bohlke, O. (2003). A Comparison of Student Participation Levels by Groups Size and Language Stages during Chatroom and Face-To-Face Discussion in German. *CALICO Journal*, 21 (1), 67-87.

Jauregi, K. and Bañados, E. (2008). Virtual Interaction through Video-Web Communication: A Step towards Enriching and Internationalizing Language

Learning Programs. *ReCall*, 20 (2), 183-207. Doi:
10.1017/S0958344008000529 Printed in the United Kingdom.

Kitade, K. (2000). L2 Learners' Discourse and SLA theories in CMC: Collaborative Interaction in Internet Chat. *Computer Assisted Language Learning*, 13, 143-166.

Lai, C. and Zhao, Y. (2006). Noticing and Text-Based Chat. *Language Learning & Technology*, 10 (3), 102-120.

Lee, L. (2002). Synchronous Online Exchanges: a Study of Modification Devices on Non-Native Discourse. *System: An International Journal of Educational Technology and Applied Linguistics*, 30 (3), 275-288.

— (2009). Promoting Intercultural Exchanges with Blogs and Podcasting: A Study of Spanish-American Telecollaboration. *Computer Assisted Language Learning*, 22 (5), 425-443.

Long, M. H. (1996). Modality and the Linguistic Environment in Second Language Acquisition. In W. C. Ritchie and T. K. Ghatia (Eds.), *Handbook of Second Language Acquisition* (413-468). San Diego (California): Academic Press.

Minnesota Language Proficiency Assessment (MLPA). Hosted by Center for Advanced Research on Language Acquisition (CARLA) at the University of Minnesota. Retrieved from <http://www.carla.umn.edu/assessment/MLPA.html#take>

Payne, J. S. and Whitney, P. J. (2002). Developing L2 oral Proficiency through Synchronous CMC: Output Working Memory, and Interlanguage Development. *CALICO Journal*, 20 (1), 7-32.

Pellettieri, J. (2000). Negotiation in Cyberspace: The Role of Chatting in the Development of Grammatical Competence. In M. Warschauer and R. Kern (Eds.), *Network-Based Language Teaching: Concepts and Practice* (59-86).

United Kingdom: Cambridge University Press.

Ritchie, W. C. and Ghatia, T. K. (Eds.) (1996). *Handbook of Second Language Acquisition*. San Diego (California): Academic Press.

Sagarra, N. and Zapata, G. C. (2008). Blending Classroom Instruction with Online Homework: A Study of Student Perceptions of Computer- Assisted L2 Learning. *ReCall*, 20 (2), 208-224.

Tam, S. S., Kan N. H. and Ng, L. L. (2010). Low Proficiency Learners in Synchronous Computer-Assisted and Face-to-Face Interactions. *The Turkish Online Journal of Educational Technology*, 9 (3), 61-75.

Tudini, V. (2007). Negotiation and Intercultural Learning in Italian Native Speaker Chatrooms. *The Modern Language Journal*, 91 (4), 577-601.

Van Deuten-Scholl, N. and Homberger, N. H. (Eds.) (2008). *Encyclopedia of Language and Education. Vol. 4: Second and Foreign Language Education*, 281-292. (2nd ed.). New York: Springer Science + Business Media LLC.

Dirección de contacto: Isabel Moreno-López. Goucher College, Department of Hispanic Languages, Literatures and Cultures. Van Meter 153, 1021 Dulaney Road; 21204-2794 Baltimore, Maryland, Estados Unidos. E-mail: imoreno@goucher.edu