





Mobile Instant Messaging: Whatsapp and its Potential to Develop Oral Skills

Mensajería instantánea móvil: Whatsapp y su potencial para desarrollar las destrezas orales

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ABSTRACT

This study investigates the benefits of Mobile Mediated Communication (MMC) to develop oral skills in second-language learners. A total of 80 Spanish students taking a B1 English course at the University of Almería were studied in this research. According to treatment type, subjects were divided in two groups, experimental and control. A “Whatsapp” group was created where 40 of these students participated in a daily interaction during six months. The samples collected in the application as well as a speaking were used to measure the students’ degree of oral development and the type and triggers of the language related episodes (LRE) given rise to mobile chat-based oral interaction. This study focuses on such interaction and seeks to measure the students’ degree of oral development through a mixed analysis approach. A temporal axis is used to measure the differences between the groups studied. Significant improvements in term of oral proficiency were observed in the experimental group and negotiations were the LRE most common throughout the activity. It is worth mention that Mobile learning offers an environment where learners can ubiquitously negotiate meaning, reflect and evaluate on their own performance through authentic interaction and feedback, constituting a powerful tool for developing second language proficiency.

RESUMEN

La presente investigación analiza los beneficios de la comunicación mediante teléfonos móviles para desarrollar las destrezas orales de los estudiantes en la segunda lengua. Un total de 80 estudiantes españoles que realizaban un curso de inglés nivel B1 en la Universidad de Almería participaron en el estudio. De acuerdo con el tipo de tratamiento, los sujetos fueron divididos en dos grupos, experimental y control. Mediante la creación de un grupo de «Whatsapp», 40 de dichos sujetos participaron en una interacción oral diaria durante 6 meses. Las muestras recogidas en la aplicación, así como un examen oral, fueron utilizados para analizar el grado en que los estudiantes desarrollan la destreza oral y los tipos y desencadenantes que dan lugar a episodios relacionados con el lenguaje en los chats orales. Este estudio se centra en la interacción utilizando un análisis mixto y un eje temporal con el fin de medir las diferencias entre los grupos analizados. Los resultados demuestran mejoras significativas en cuanto a la competencia oral en los alumnos del grupo en el que se implementó la actividad, siendo las negociaciones de significado el episodio relacionado con el lenguaje más común durante la interacción. Cabe destacar la accesibilidad que la mensajería móvil confiere a los alumnos, pues son capaces de negociar el significado, reflexionar y evaluar sus propias actuaciones mediante interacción real y feed-back.

KEYWORDS | PALABRAS CLAVE

Mobile-mediated communication, BYOD, mobile chat, interaction, educational technology, Whatsapp, mobile learning, virtual environments, virtual learning.

Comunicación móvil, BYOD, chat, interacción, tecnología educativa, Whatsapp, aprendizaje móvil, entornos virtuales, aprendizaje virtual.



1. Introduction and statement of the question

Mobile phones and, consequently, wireless computing devices have changed the e-learning landscape in many different ways due to widespread access to such inexpensive and sophisticated devices (Miangah & Nezarat, 2012). Kukulska-Hulme & Shield (2008) and Trifonova & Ronchetti (2004) place emphasis on the characteristics of mobile devices as small, autonomous and unobtrusive qualities that provide learners with easy access to all resources. Advances in mobile technologies give the chance to owners of mobile devices to access not just educational resources, but the possibility of engaging in many forms of social interaction and participation through mobile phones (Comas-Quinn, De-los-Arcos, & Mardomingo, 2012). This mobile social interaction and participation is becoming a powerful tool in L2 (second language) development and constitutes an educational resource yet to be exploited by L2 teachers. Many researchers agree on the effectiveness of language learning materials based on real-life interaction, therefore it is vital to take into consideration not only materials, but real-life interaction itself. Additionally, mobile phones provide an opportunity to escape from the traditional constraints of time and place that determine existing curricula and allow different skills to be practised “on the go”, giving the chance to orientate the foreign language curriculum towards more spoken communication (Demouy & Kukulska-Hulme, 2010; Kukulska-Hulme, 2012).

Narrowing the scope of this research, there will be a focus on the use of instant messaging applications to improve L2 oral skills. With regard to this field, it is defined as mobile instant messaging (MIM), an asynchronous, and in some occasions synchronous communication tool that operates through wireless connections and handhelds via the Internet, allowing students to hold a conversation in real time (Dourando, Parker, & De-la-Harpe, 2007; Rambe & Bere, 2013). Thanks to the growing number of applications providing Voice over Internet (VoIP), teacher-learner and learner-learner interaction is rapidly increasing. Some of these applications for language learning include voice search, voice email, and audio recording, audio capabilities which, as supported by other researchers in the field (Godwin-Jones, 2011), will play a crucial role in second language use and learning. Among the assets of these applications are: promoting contact between students and teachers; fostering interaction amongst students and promoting academic cooperation; encouraging active learning; providing instant feedback; and developing high communicative expectations (Desai & Graves, 2006; Farmer, 2003; Rambe & Bere, 2013).

Several applications providing conversation in real time have appeared recently and have spread worldwide within just a few years, as can be seen with the case of “Whatsapp” and its competitors “Line”, “Kik Messenger”, “Telegram”, “Wechat”, “Tango”, “Text free”, all which provide free text, voice, and image messaging via the Internet. This tremendous growth needs to be taken into consideration by L2 teachers who now have access to a new field in which second language learning may take place.

Many studies (Andujar, 2016; Bouhnik & Deshen, 2014; Vazquez-Cano & al., 2015; Parejo, 2016) have focused on the possibilities that mobile devices offer, and in particular “Whatsapp”, to improve the vocabulary and writing skills of the learners. Nevertheless, it is necessary to overcome this tendency in order to explore other aspects of language learning such as oral interaction (Kukulska-Hulme, 2009), which in many cases is a problematic area for L2 students. Several exceptions to text-based learning patterns can be found in studies such as in the case of audioblogs (Hsu, Wang, & Comac, 2008), in which answers were recorded thanks to mobile phones used to manage and store oral assignments. Further examples are Tai (2012) where multimedia capabilities of smartphones are exploited in different ways, using either calls, SMS or MSN. In this task-based learning approach, participants need to read several tasks and cooperate in order to formulate responses in spoken or written form.

In addition, software developments in voice recognition systems are leading to studies such as Stewart & File’s (2007) system called “Let’s Chat”, where students can chat with a human partner which comprises pre-stored phrases or “Candle Talk” (Chiu, Liu, & Yeh, 2007) where a conversational environment is provided and speech interactions are enhanced thanks to speech recognition. As claimed by Levy (2009) these developments are also leading to the use of “chatterbots”, although psychological studies such as Atkinson, Mayer, & Merrill (2005) and Mayer & al. (2003) regarding the use of a social agent in multimedia learning showed that students participating in human voice groups significantly outscored those groups in which the “chatterbot” was used on learning performance tests. Thus, interaction and learning are fostered by the use of visual and social cues.

It is also worth noting that several researchers in mobile-assisted language learning (MALL) have made notable observations regarding the speech aspect of mobile learning. Joliet (2007) pointed out the fact that these devices allowed students to record and listen to their own utterances, which helped them to compare and repair mispronunciations and mistakes in their speeches. In terms of assessment, pronunciation could be easily evaluated as lan-

guage performance was recorded in the device, thus teachers could focus on particular aspects of speech (Miangah & Nezarat, 2012). Similarly, Kukulka-Hulme, & Shield (2008) emphasized the need for developing learning activities regarding voice discussions to take advantage of this mobile technology in second language learning.

2. Method

2.1. Study

In order to accomplish its aims, this study used four groups, each consisting of 20 participants. According to experiment type, learners were divided into two main groups with 40 students each. The study involved Spanish students from the University of Almeria who were taking a B1 English course at the UAL Language School. The materials and contents provided in the course met the parameters established by CEFR for a B1 level. The expected entry level was A2+ a placement test which was administered to the students at the beginning of the course in order to ensure they were able to take it. Ages ranging from 18 to 31 were found in both groups. 32 participants were male and 48 female. The length

of the course was six months from November to April where learners met for 3 hours per week. The researcher participated actively in the process, as he was the teacher of the groups studied, following concerns of researchers in the field regarding the need for guidance when using mobile devices (Kukulka-Hulme, 2009). Nevertheless, the researcher did not

take part in the evaluation of the subjects studied in order to avoid compromising the results. Students in the experimental group join a "Whatsapp" group consisting of 40 students where the interactions took place.

The study focuses on determining the potential of mobile instant messaging services like "WhatsApp" in order to develop ESL speaking. The "WhatsApp" application is proposed as a tool to encourage participation and interaction during the course through the creation of groups in which different users can interact through text, voice, images and video-sharing. Exchanges between users can be produced in a synchronous or asynchronous manner, thanks to the voice recording system provided by the application and are received on phones as alerts. The application did not substitute educational explanations but was used as tool to improve speaking skills and keep communication active outside the classroom on a daily basis, becoming a constant support for language use. All the students participated in the activity, as they all had smartphones as well as the previously downloaded "WhatsApp" application. After the creation of the "WhatsApp" group, the activity was carried out taking into account a series of premises established by the teacher: writing was forbidden in order to force learners to speak; English language use was compulsory; a different question had to be formulated by a different student every day, 7 days per week; the choice of topic for the question was open; each student had to provide at least one answer per question; image-sharing was allowed; the teacher also participated as a student, responding to the questions. The teacher participated actively in the activity and errors were not corrected in an explicit manner during interaction. If necessary, students' answers were reformulated, and following Hanaoka and Izumi's (2012) recommendation for lower proficiency learners, reformulated parts were emphasized helping participants to notice them.

Two groups, a control and an experimental one, were set up and although the control group did not receive any treatment apart from the traditional instruction, it was used for studying the differences between the groups after implementation. In this manner, we were able to perceive the effect of the action on the experimental group subjects. Regarding tuition, students in both groups attended the same number of classes where the same teaching materials were used. A lesson plan was set up in order to guarantee the same tuition in both groups. After implementation of the programme for the experimental group, we verified its effect through the comparison of the results obtained. The identities of the participants have been changed so they remain disguised in this investigation, meeting ethical guidelines set by the American Psychological Association (2002).

MMC becomes an available resource where dynamic interactions between learner, task, and virtual environment, together with the inherent ubiquitous, spontaneous and personalized characteristics of these devices constitute a solid framework for second language acquisition.

Regarding participants in the activity, initial differences were determined by the tests given at the beginning of the course to both groups. Internal threats to validity (Campbell & Stanley, 1963: 55) and effects such as the Hawthorne effect (Mayo, 1933), the halo effect (Thorndike, 1911) and participant expectancy were minimized as the students were not aware that they were being observed and the teacher did not participate in the correction of the tests given. An external examiner was used in this process. Other threats to validity such as socio-economic and educational metadata were tackled at the beginning of the activity in order to guarantee students' participation, no matter what background they came from. Furthermore, the timetable of the groups was different, the experimental group had classes in the morning and the control in the evening, therefore students could not talk about the activities carried out in both groups as they did not know each other.

2.2. Research method

The aim of this study is to investigate speaking development in ESL learners, through analysing interactions in a mobile voice-based teacher-led chat and seeks to answer the following questions: 1) Has the implementation of MMC in the experimental group brought about important changes in speaking skills of the subjects?; 2) What are the main triggers and types of LREs in MMC?; 3) Is the use of mobile chat applications useful for this development? Regarding the last question, the study tries to answer aspects related to the potential value of the applications in ESL speaking, as well as how this MMC provides opportunities for interaction and consequently, second language development.

Alpha level was set at .05 under a non-directional (two-tailed) hypothesis. Regarding the research design, Creswell (2003) fixed mixed methods were followed as the use of qualitative and quantitative methods was predetermined and planned at the start of the research process, hence contrasting with the experimental paradigm. Null and alternative hypotheses were posed and tested in order to reveal significant differences between two pre-existing groups (control and experimental group):

Alternative hypothesis: At the end of the study, the speaking proficiency level of the students in the voice-based chat will be higher than those in the control group.

Null hypothesis: No significant differences will be found between the speaking proficiency of both groups.

Ex post facto criterion groups are observed in the design (Hatch & Lazaraton, 1991; Shavelson, 1981) as descriptive measures (central tendency and variability) are analysed. With regard to data collection, which was categorized in the tradition of discourse analysis, a naturalistic inquiry was used (Nunan, 1992). In terms of design, a sequential quantitative-qualitative approach was used, first conducting the quantitative phase and then the subsequent qualitative phase. More specifically, a qualitative follow-up interaction analysis was carried out where an analysis of variance and later qualitative analysis of the data pertaining to the participants is studied (Onwuegbuzie & Teddlie, 2003).

2.3. Data collection instruments

2.3.1. Speaking test

A spoken English test at the beginning and end of the course was administered in class. Both tests were conducted using two students at a time and interaction was recorded for later scoring. The length of each test was 15-20 minutes for each pair. Regarding the design of the test, it was conceived to provide participants with enough opportunities to speak, following Hughes (2003) study regarding test creation. It consisted of 1) Students being asked about personal information such as their name, origin, family, work and studies. This first part lasted 5 minutes serving as a way for learners to adapt to the examiner's voice and accent as well as to reduce their anxiety; 2) Two pictures were given to each student who had to describe and compare the elements appearing in both for 1-2 minutes; 3) A question surrounded by different images was given to each pair. Students needed to interact and talk about all the different elements while answering the question, asking for opinions and expressing agreement and disagreement. The activity lasted 5 minutes and students were asked to reach a conclusion by the end of the exercise, and 4) Students were given two cards, one per person, and a role-play was performed by each participant following the ideas in each card. The time of the activity was 5 minutes and students got involved in a debate regarding the different cards.

Practical considerations included arranging a specific room for the test in order to guarantee clarity of the recordings, recording all students' oral productions in order to later check their performance, and allowing students to choose their partner, reducing anxiety (Norton, 2005; Satar & Özdener, 2008).

Assessment was carried out using Hughes' (2003) general proficiency speaking scale which consisted of comprehension, grammar, vocabulary, fluency and pronunciation. A marking guide 1 to 6 in each of the parts is also presented in the scale. Students of both the control and experimental groups were given this exam.

2.3.2. Samples in the application

The language samples obtained in the mobile voice chat were used to measure the quantity and type of LRE elicited from participants. Following Bueno-Alastuey's (2013) division, LREs were divided into negotiation and negative feedback. The first one was operationalized by instances where participants showed misunderstanding by using questions or by repeating a previous question with rising intonation (Bueno-Alastuey, 2011; Lai & Zhao, 2006; Williams, 1999). Negative feedback was operationalized as an interlocutor's move where a non-target-like feature was indicated whether explicitly or implicitly (Iwashita, 2003). This last LRE was further subdivided into: 1) Recasts: restatement of a non-target-like in a more target-like way (Long, 1996); 2) Elicitation: a response to a previous utterance aiming at a more target-like form without providing any metalinguistic information. Explicit correction was not considered necessary in this study, as the aim of the activity was to build a synthetic environment where interaction could play a fundamental part. Furthermore the kind of triggers –whether lexical, morphosyntactic or phonetic– leading to these LREs were analysed. (Nakahama & al., 2001).

3. Analysis and results

3.1. Quantitative procedures

The ANOVA related samples repeated measures test was conducted to confirm that these differences were statistically significant and the Bonferroni adjustment was used to counteract multiple comparisons. The pre-test results of the speaking test only yielded major differences between the experimental and control group in vocabulary ($X=2.1$; $p<.05$), the mean points for pronunciation ($X=.12$; $p>.05$), grammar ($X=0.7$; $p>.05$), fluency ($X=.17$; $p>.05$) and comprehension ($X=.25$; $p>.05$) showed no statistical significance as presented in table 1.

Table 1: Pre-test speaking measures in the control and experimental groups

	Pronunciation			Grammar			Vocabulary			Fluency			Comprehension		
	Total	Mean	SD	Total	Mean	SD	Total	Mean	SD	Total	Mean	SD	Total	Mean	SD
CG	40	1.23	.86	40	14.25	5.02	40	7.70	3.05	40	4.70	1.53	40	10.65	2.77
EG	40	1.10	1.77	40	21	4.5	40	9.85	3.66	40	4.88	1.58	40	13.9	2.24

Statistically significant differences were found between groups in the post-test, as presented in table 2. The ratios within the subjects for pronunciation ($F(1,78)=16.70$; $p=.00$), grammar ($F(1,78)=4.21$; $p=.04$), vocabulary ($F(1,78)=24.35$; $p=.00$), fluency ($F(1,78)=221.4$; $p=.00$) and comprehension ($F(1,78)=37.46$; $p=.00$) showed a greater improvement in the experimental group students, thus confirming the hypothesis that through the use of the mobile voice-based chat, the speaking proficiency of experimental group students is higher than those in the control group.

Post hoc tests were used to measure these differences between pre-test and post-test in both groups and the Bonferroni adjustment showed statistically significant differences in the speaking skills of the experimental group, with a greater improvement in the mean points for pronunciation ($X=.45$; $p<.05$), grammar ($X=2.4$; $p<.05$), vocabulary ($X=4.4$; $p<.05$), fluency ($X=3.2$; $p<.05$) and comprehension ($X=2.57$; $p<.05$).

These findings confirm a strong correlation between the use of mobile voice-based chat and speaking proficiency development, suggesting some speaking abilities which have undergone a greater improvement than others, as can be seen in the case of fluency, pronunciation and vocabulary. Notwithstanding that grammar and comprehension also showed statistically significant differences, considerably greater effects are observed in the skills previously mentioned.

Table 2: Post-test speaking measures in the control and experimental group

	Pronunciation			Grammar			Vocabulary			Fluency			Comprehension		
	Total	Mean	SD	Total	Mean	SD	Total	Mean	SD	Total	Mean	SD	Total	Mean	SD
CG	40	1.80	.51	40	15	4.7	40	12.4	2.9	40	5.45	1.35	40	10.4	2.69
EG	40	2.25	.43	40	23.40	4.25	40	16.8	2.74	40	8.65	1.31	40	16.47	2.5

Regarding the type of LREs found in the mobile voice chat, as shown in table 3, the number of negotiations made by participants was considerably higher than the number of recasts and elicitations. Similarly, studies such as Bueno-Alastuey (2013) and Jepson (2005) in synchronous voice-based computer-mediated communication (SVMC) also found a higher number of negotiations and tried to explain that the student may simply feel uncomfortable giving negative feedback or may not see the need for accuracy. Nevertheless, the number of recasts was also significant and could be explained by the conditions established by the teacher at the beginning of the activity and the interactive approach used throughout the process. Furthermore, as shown in figure 1, the data collected show a decrease in the number of negotiations, recasts and elicitations over time which could mean that the proficiency of the students was significantly higher at the end of the course and therefore, the number of LREs was diminished. Such increase in proficiency was later corroborated by the pre and post-test.

Negotiations were the most abundant with percentages per month ranging from 58% to 67% of the total LREs, which highlights the use of the application as a rich environment for negotiations. Regarding negative feedback, recasts were more frequent than elicitations with percentages from 23% to 30%, which indicates that students collaborate on constructing learning and helping their partners in oral production.

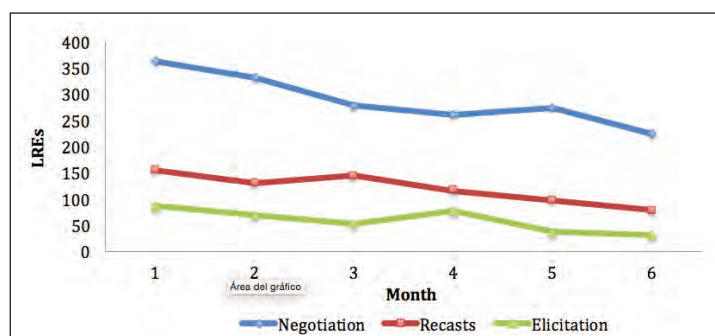


Figure 1. Trend of LREs per month.

was remarkable. Nevertheless and as opposed to the studies previously mentioned, the amount of negative feedback was of considerable significance.

Lexical triggers were also found in a high proportion as can be seen in both LREs: negotiation (30% to 37% of the total negotiations) and negative feedback (35% to 40% of the total negative feedback). Possible explanations for these figures could be the higher level of proficiency of the teacher who, due to wider lexical variety, pushed the

collaborate on constructing learning and helping their partners in oral production.

Regarding the type of LRE depending on the trigger, as shown in table 4, phonetic triggers were the most abundant, which may be due to the fact that students sometimes struggle to understand their partners because of mispronunciation of certain words. In line with previous studies such as Bueno-Alastuey (2013) or Williams (1999), the number of negotiations due to phonetic triggers

Month	Global		Lexical		Morphosyntactic		Phonetic	
	Ne.	NF	Ne.	NF	Ne.	NF	Ne.	NF
1	74 (20.4%)	42 (17.4%)	89 (24.5%)	70 (29%)	64 (17.6%)	33 (13.7%)	135 (37.2%)	96 (39.8%)
2	46 (13.8%)	31 (15.5%)	103 (31.1%)	59 (29.6%)	77 (23.2%)	29 (14.5%)	105 (31.7%)	80 (40.2%)
3	58 (21%)	24 (12.1%)	71 (25.8%)	63 (32%)	53 (19.2%)	38 (19.2%)	93 (33.8%)	72 (36.5%)
4	51 (19.6%)	17 (8.8%)	89 (34.2%)	71 (37%)	42 (16.1%)	28 (14.5%)	78 (30%)	76 (39.5%)
5	58 (21.2%)	20 (15%)	94 (34.4%)	41 (30.8%)	32 (11.7%)	19 (14.2%)	89 (32.6%)	53 (39.8%)
6	42 (18.7%)	12 (11.1%)	79 (35.2%)	32 (29.6%)	36 (16%)	26 (24%)	67 (29.9%)	38 (35.1%)

students towards unknown vocabulary. Furthermore, the varied lexical richness of the participants also caused a high number of LREs. Global triggers (13% to 21% of the negotiations and 9% to 17% of the negative feedback) and morphosyntactic triggers (12% to 23% of the negotiations and 14% to 24% of the negative feedback) were found in a lower proportion, although the latter show an increase in both LREs during the last month which may be due to the proximity of the end-of-course exam where a Use of English part was included.

3.2. Qualitative procedures

Negotiations and negative feedback utterances taking place in the application can be also observed from a qualitative perspective. Thus, some examples can be examined in order to exemplify the different LREs and how such processes led to modified output.

3.2.1 Negotiations

- Example 1: Student A: “I went to the /dinin/ room”; Student B: “To the /dinin/ room?”; Student A: “mm... to the /'da:nɪŋ/ room”; Student B: “Oh! Did you eat something special?”.
- Example 2: Student A: “Yesterday the football match was /grit/”; Student B: “I don’t understand you, can you repeat it again please?”; Student A: “The match was /gret/”; Student B: “Ok, I thought you mean it was bad”.

Examples 1 and 2 show how students negotiate the meaning of certain words. In these cases due to mispronunciation of particular words that made it difficult for the listeners to understand the utterance, negotiations were required. In both cases, without an explicit correction or a recast, students repair communication that may be due to the fact that: “Student A” played the recording another time and noticed the mistake; “Student B” forced “Student A” to check his/her oral production which led to the repair. In both cases modified output was brought about as students were able to determine the source of the error as well as the solution to achieve understanding. This phonetic trigger that led to the LRE was observed by the end of the activity in order to see if such student kept mispronouncing the word. Positive results were found in most of the words tracked and this correlates with a decrease in the number of LREs during the last months of the activity as shown in figure 1. Consequently, and in line with previous studies regarding SVCMC (Bueno-Alastuey, 2013; Satar & Özdenler, 2008; Jepson, 2005; Volle, 2005), this medium provides learners with a higher number of occasions to notice non-target items. Thus, the awareness of the difficulties and “gaps” in students’ interlanguage also increased. That said, it is necessary to take into consideration that the possibilities of noticing such difficulties are considerably higher in asynchronous voice-based mobile-mediated communication (AVMMC) than SVMCMC because of the inherent characteristics of these devices, although further studies regarding differences between both environments are needed.

3.2.2. Negative feedback

- Recasts:
 - Example 3: Student A: “There are many place in Spain where you can go to the beach?”; Student B: “Many places in Spain to go to the beach?”; Student A: “Yes, places sorry”.
 - Example 4: Student A: “I like drinking /dʒuis/ in the morning”; Student B: “Drinking /dʒu:s/ is the best!”; Student A: “I love /dʒu:s/ with toasts and tomato”.
- Elicitations:
 - Example 5: Student A: “I meet with my friends twice a week”; Student B: “Meet with your friends?”.

In examples 3 and 4 students provided recasts to their partner when a mispronunciation was noticed. In some cases, in order not to generalize mispronunciation when participants were unaware of the correction or simply did not want to repair communication because the message was understood, the teacher took part in the conversation as another participant, acting as a source of target language input. Providing corrections to the utterances was not only a role of the teacher but of the rest of participants that were encouraged to help their partners to improve. Example 5 shows elicitation that took place when non-target-like items appeared where “Student B”, simply by repeating the previous utterance with rising intonation, made “Student A” aware of the error. In this type of negative feedback, “gaps” were not as salient as in recasts and students needed a minimum of one extra correction apart from the elicitation in order to acquire the appropriate form. This was due to the fact that students in this last case emphasized reformulated parts. Several examples of recasts were observed and tracked throughout the conversation in order to see students’ L2 development by the end of the activity. In this case, those examples which were more salient showed positive results in utterances observed later in the interaction. Notwithstanding that acquisition in LRE was higher than in negative feedback, as shown in the statistical figures, the work done by the rest of the participants was outstanding, becoming a source of L2 input even when the teacher was not participating in the conversation.

4. Discussion and conclusions

Mobile learning offers an environment where learners can ubiquitously negotiate meaning, reflect and evaluate

on their own performance through authentic interaction and feedback. Voice-based MMC constitutes a powerful tool for developing second language speaking proficiency as shown throughout this investigation where the treatment group outperformed the control in every aspect of the speaking proficiency scale. Furthermore, as found in the MALL Research Project Report (2009), teachers can listen to the recordings several times in order to identify student's difficulties and computerized recordings provide the possibility of creating a media board for subsequent evaluation of the participants. Students make use of their spare time for language practice and together with the considerable use of this type of application, teachers are able to avoid the time restrictions of traditional classroom environments.

Apart from the findings in terms of proficiency, very positive results can be seen, as NSs-NSs conversations form a source of LREs, phonetic ones being the most common throughout the interactions in line with Bueno-Alastuey (2013) and Jepson's (2005) findings in SVCMC. In a similar vein, negotiations were the most abundant LRE observed in this research. Nevertheless, remarkable results have been found in terms of recasts, which contrasts with the traditional pattern in computer-mediated communication (CMC). As explained earlier in this query, this might be due to the previous considerations stated by the teacher, but further studies regarding the differences between CMC and MMC are required.

Fundamental factors in the language learning process are observed thanks to the use of MMC. It is widely agreed that autonomy and authenticity play a relevant role in second language acquisition and thus, need to be taken into consideration (Farmer & Nucamendi, 2012). However, in studies such Al-Jarf (2012), regarding mobile technology and learners' autonomy in oral skill acquisition, learners struggle to recognize the value of MP3 audios as a step towards real communication. Throughout this investigation, students were involved in real interaction and thus could notice the advantages of the chat conversation from the beginning. In addition, mobile phones seem to have a positive influence on learners' attributes such as motivation, (Al-Jarf, 2012; Kessler, 2010; Satar & Özdener, 2008) and confidence (Shih, Chu, Hwang, & Kinshuk, 2011).

Previous limitations regarding mobile learning such as those in relation to screen size and audio-visual quality (Chinnery, 2006; Jones, 2012) are being minimized as mobile technology is fast-evolving, as is evident in the race amongst top mobile companies, competing to release the most technologically advanced devices. MMC becomes an available resource where dynamic interactions between learner, task, and virtual environment, together with the inherent ubiquitous, spontaneous and personalized characteristics of these devices constitute a solid framework for second language acquisition.

References

- Al-Jarf, R. (2012). Mobile Technology and Student Autonomy in Oral Skill Acquisition. In *Left to My Own Devices: Learner Autonomy and Mobile-Assisted Language Learning* (pp.105-130). Bingley: Emerald Group.
- American Psychological Association. (2002). *Ethical Principles of Psychologists and Code of Conduct*. (<http://goo.gl/lqjPR0>) (2016-01-22).
- Andujar, A. (2016). Benefits of Mobile Instant Messaging to Develop ESL Writing (in Press). *System*. <https://doi.org/10.1016/j.system.2016.07.004>
- Atkinson, R.K., Mayer, R.E., & Merrill, M.M. (2005). Fostering Social Agency in Multimedia Learning: Examining the Impact of an Animated Agent's Voice. *Contemporary Educational Psychology*, 30(1), 117-139. <https://doi.org/10.1016/j.cedpsych.2004.07.001>
- Bouhnik, D., & Deshen, M. (2014). WhatsApp Goes to School: Mobile Instant Messaging between Teachers and Students. *Journal of Information Technology Education Research*, 13, 217-231. (<http://goo.gl/0RzAmi>) (2016-08-06).
- Bueno-Alastuey, M.C. (2011). Perceived Benefits and Drawbacks of Synchronous Voice-based Computer-mediated Communication in the Foreign Language Classroom. *Computer Assisted Language Learning*, 24(5), 419-432. <https://doi.org/10.1080/09588221.2011.574639>
- Bueno-Alastuey, M.C. (2013). Interactional Feedback in Synchronous Voice-based Computer Mediated Communication: Effect of Dyad. *System*, 41(3), 543-559. <https://doi.org/10.1016/j.system.2013.05.005>
- Campbell, D., & Stanley, J. (1963). Experimental and Quasi-experimental Designs for Research . In N.L. Gage (Ed.), *Handbook of Research on Teaching* (pp. 171-246). Chicago: Rand-McNally.
- Chinnery, G.M. (2006). Going to the MALL: Mobile Assisted Language Learning. *Language Learning & Technology*, 10(1), 9-16. (<https://goo.gl/y1d89A>) (2016-02-03).
- Chiu, T., Liou, H., & Yeh, Y. (2007). A Study of Web-based Oral Activities Enhanced by Automatic Speech Recognition for EFL College Learning. *Computer Assisted Language Learning*, 20(3), 209-233. <https://doi.org/10.1080/09588220701489374>
- Comas-Quinn, A., De-los-Arcos, B., & Mardomingo, R. (2012). Virtual Learning Environments (VLEs) for Distance Language Learning: Shifting Tutor Roles in a Contested Space for Interaction. *Computer Assisted Language Learning*, 25(2), 129-143. <https://doi.org/10.1080/09588221.2011.636055>
- Creswell, J.W. (2003). *Research Design: Qualitative, Quantitative and Mixed Method Approaches*. Thousand Oaks: Sage.
- Demouy, V., & Kukulka-Hulme, A. (2010). On the Spot: Using Mobile Devices for Listening and Speaking Practice on a French Language Programme. *The Journal of Open, Distance and e-Learning*, 25(3), 217-232. (<http://goo.gl/2vkjo4>) (2016-02-03).

- Desai, C.M., & Graves, S.J. (2006). Instruction Via Instant Messaging Reference: What's Happening? *The Electronic Library*, 24(2), 174-189. <https://doi.org/10.1108/02640470610660369>
- Dourando, D., Parker, M., & De-la-Harpe, R. (2007). Investigation into the Usage of Mobile Instant Messaging in Tertiary Education. *Proceedings of Annual Conference of World Wide Web Application*. <https://doi.org/10.4018/jictrda.2012070102>
- Farmer, F., & Nucamendi, M.E.L. (2012). Towards a Rationale for Mobile Learning. Left to My Own Devices: Learner Autonomy and Mobile-Assisted Language Learning. In J.E. Diaz-Vera (Ed.), *Left to my own*. (pp. 21-44). Bingley: Emerald Group.
- Farmer, R. (2003). Instant Messaging - Collaborative Tool or Educator's Nightmare. *The North American Web-Based Learning Conference (NAWeb 2003)*. (<https://goo.gl/jkaga5>) (2015-09-02).
- Godwin-Jones, R. (2011). Emerging Technologies: Mobile Apps for Language Learning. *Language Learning & Technology*, 15(2), 2-11. (<http://goo.gl/VRBkLq>) (2016-04-08).
- Hanaoka, O., & Izumi, S. (2012). Noticing and Uptake: Addressing Pre-articulated Covert Problems in L2 Writing. *Journal of Second Language Writing*, 21(4), 332-347. <https://doi.org/10.1016/j.jslw.2012.09.008>
- Hatch, E.M., & Lazaraton, A. (1991). *The Research Manual: Design and Statistics for Applied Linguistics*. New York: Newbury House Publishers.
- Hsu, H., Wang, S., & Comac, L. (2008). Using Audioblogs to Assist English-language Learning: An Investigation into Student Perception. *Computer Assisted Language Learning*, 21(2), 181-198. <https://doi.org/10.1080/09588220801943775>
- Hughes, A. (2003). *Testing for Language Teachers*. Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511732980>
- Iwashita, N. (2003). Negative Feedback and Positive Evidence in Task-based Interaction. *Studies in Second Language Acquisition*, 25(01), 1-36. <https://doi.org/10.1017/S0272263103000019>
- Jepson, K. (2005). Conversations –and Negotiated Interaction– in Text and Voice Chat Rooms. *Language Learning & Technology*, 9(3), 79-98. (<http://goo.gl/GPh5GG>) (2015-09-24).
- Jolliet, Y. (2007). M-learning: A Pedagogical and Technological Model for Language Learning on Mobile Phones. *Proceedings Workshop on Blended Learning, 2007* (pp. 327-339). (<https://goo.gl/or9aqZ>) (2016-02-03).
- Jones, C. (2012). Networked Learning, Stepping Beyond the Net Generation and Digital Natives. In L. Dirckinck-Holmfeld, V. Hodgson & D. McConnell (Eds.), *Exploring the Theory, Pedagogy and Practice of Networked Learning* (pp. 27-41). New York: Springer.
- Kessler, G. (2010). Fluency and Anxiety in Self-access Speaking Tasks: The Influence of Environment. *Computer Assisted Language Learning*, 23(4), 361-375. <https://doi.org/10.1080/09588221.2010.512551>
- Kukulka-Hulme, A. (2009). Will Mobile Learning Change Language Learning? *ReCALL*, 21(2), 157-165. <https://doi.org/10.1017/S0958344009000202>
- Kukulka-Hulme, A. (2012). How Should the Higher Education Workforce Adapt to Advancements in Technology for Teaching and Learning? *The Internet and Higher Education*, 15(4), 247-254. <https://doi.org/10.1016/j.iheduc.2011.12.002>
- Kukulka-Hulme, A., & Shield, L. (2008). An Overview of Mobile Assisted Language Learning: From Content Delivery to Supported Collaboration and Interaction. *ReCALL*, 20(3), 271-289. <https://doi.org/10.1017/S0958344008000335>
- Lai, C., & Zhao, Y. (2006). Noticing and Text-based Chat. *Language Learning & Technology*, 10(3), 102-120. (<http://goo.gl/sxKZDZ>) (2016-03-21).
- Levy, M. (2009). Technologies in Use for Second Language Learning. *The Modern Language Journal*, 93(1), 769-782. <https://doi.org/10.1111/j.1540-4781.2009.00972.x>
- Long, M.H. (1996). The Role of the Linguistic Environment in Second Language Acquisition. In W. Ritchie, & T. Bathia (Eds.), *Handbook of Research on Second Language Acquisition* (pp. 413-469). New York: Academic Press.
- MALL (Research Project Report) (2009). *Mobile Application for Language Learning*. Curriculum Corporation: The Learning Federation. (<http://goo.gl/2elR23>) (2015-12-09).
- Mayer, R.E., Sobko, K., & Mautone, P.D. (2003). Social Cues in Multimedia Learning: Role of Speaker's Voice. *Journal of Educational Psychology*, 95, 419-425. <https://doi.org/10.1037/0022-0663.95.2.419>
- Mayo, E. (1933). *The Human Problems of and Industrial Civilization*. New York: Macmillan.
- Miangah, T.M., & Nezarat, A. (2012). Mobile-assisted Language Learning. *LJDPS*, 3(1), 309-319. (<http://goo.gl/Mw9PO9>) (2016-03-06).
- Nakahama, Y., Tyler, A., & Van Lier, L. (2001). Negotiation of Meaning in Conversational and Information Gap Activities: A Comparative Discourse Analysis. *TESOL Quarterly*, 35, 377-404. <https://doi.org/10.2307/3588028>
- Norton, J. (2005). The Paired Format in the Cambridge Speaking Tests. *ELT Journal*, 59, 287-297. <https://doi.org/10.1093/elt/cci057>
- Nunan, D. (1992). *Research Methods in Language Learning*. Cambridge: Cambridge University Press.
- Onwuegbuzie, A.J., & Teddlie, C. (2003). A Framework for Analyzing Data in Mixed Methods Research. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of Mixed Methods in Social and Behavioral Research* (pp. 351-383). Thousand Oaks: Sage.
- Parejo, R.M. (2016). Development of Writing Skills Using Mobile Devices for the Teaching of Foreign Languages. *Revista Complutense de Educación*, 27(2), 779. https://doi.org/10.5209/rev_RCED.2016.v27.n2.48317
- Rambe, P., & Bere, A. (2013). Using Mobile Instant Messaging to Leverage Learner Participation and Transform Pedagogy at a South African University of Technology. *British Journal of Educational Technology*, 44, 544-549. <https://doi.org/10.1111/bjet.12057>
- Satar, H., & Özdener, N. (2008). The Effects of Synchronous CMC on Speaking Proficiency and Anxiety: Text versus Voice Chat. *The Modern Language Journal*, 92(4), 595-613. <https://doi.org/10.1111/j.1540-4781.2008.00789.x>
- Shavelson, R.J. (1981). *Statistical Reasoning for the Behavioral Sciences*. Boston: Allyn and Bacon.
- Shih, J., Chu, H., & Hwang, G. (2011). An Investigation of Attitudes of Students and Teachers about Participating in a Context-aware Ubiquitous Learning Activity. *British Journal of Educational Technology*, 42(3), 373-394. <https://doi.org/10.1111/j.1467-8535.2009.01020.x>
- Stewart, I.A., & File, P. (2007). Let's Chat: A Conversational Dialogue System for Second Language Practice. *Computer Assisted Language Learning*, 20(2), 97-116. (<http://goo.gl/MVYtz8>) (2016-02-08).

- Tai, Y. (2012). Contextualizing a MALL: Practice Design and Evaluation. *Educational Technology & Society*, 15(2), 220-230. (<http://goo.gl/bRQnho>) (2016-01-07).
- Thorndike, E.L. (1911). *Animal Intelligence: Experimental Studies*. New York: Macmillan.
- Trifonova, A., & Ronchetti, M. (2004). A General Architecture to Support Mobility in Learning. *Advanced Learning Technologies*, 2004. Proceedings. *IEEE International Conference*, 26-30. (<https://goo.gl/8N1nES>) (2016-02-01).
- Vázquez-Cano, E., Mengual-Andrés, S., & Roig-Vila, R. (2015). Lexicometric Analysis of the Specificity of Teenagers' Digital Writing in WhatsApp. *Revista de Lingüística Teórica y Aplicada*, 53(1), 83-106. <https://doi.org/10.4067/S0718-48832015000100005>
- Volle, L.M. (2005). Analyzing Oral Skills in Voice E-mail and Online Interviews. *Language Learning & Technology*, 9(3), 146-163. (<http://goo.gl/i3Uaoi>) (2016-02-03).
- Williams, J. (1999). Learner Generated Attention to Form. *Language Learning*, 49(4), 583-625. <https://doi.org/10.1111/j.1467-1770.2001.tb00020.x>