ORAL LANGUAGE ACCURACY, CORRECTIVE FEEDBACK AND LEARNER

UPTAKE IN AN ONLINE EFL COURSE

Jorge Eduardo Pineda

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Thesis supervisor:

Dr. Laia Canals

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I dedicate this fruitful and sometimes difficult process to my wife and daughter who were always there, listening.

Biographical sketch

I hold a Bachelor's degree in language teaching (English and French) from Universidad de Antioquia in Medellin, Colombia. During the period of my Bachelor's degree, I conducted an investigation that focused on the implementation of reading comprehension tasks to foster an appropriate environment for learning as the problem that I identified dealt with inappropriate behavior that hindered the teaching and learning processes. I also hold a Master's degree in language teaching from Universidad de Caldas in Manizales, Colombia. During this period, I conducted an exploratory ethnographic study that aimed to identify the language learning strategies that the students of seven different languages employed to develop their communicative competence. After I carried out this study, I implemented a language learning strategy program to facilitate language learning.

I have been a language teacher for about fifteen years and I have taught English in primary schools, secondary schools, to undergraduates, and in language courses. I have also performed administrative duties in language centers. I have been a teacher of Spanish as a foreign language in the UK where I taught at different levels from high school preparing learners for their GCSE exam and in primary school where I taught kids basic language skills.

During this research experience, I have published the following articles, which are derived from the present investigation.

- Pineda, J. E. (2016). *An analysis of students' oral discourse in web-based environments: assessing the effects of learning tasks on language accuracy, correction strategies and students' repairs*. Proceedings from EDULEARN16 Conference. Barcelona.

- Pineda, J. E. (2017). *Learning English at a distance: Exploring the effects of local context on the design, implementation and the learning outcomes of a local experience of learning English*. Proceedings from CALL17 Conference: CALL in Context. Berkeley.

- Pineda, J. E. (2017). *Development of language accuracy using synchronous and asynchronous learning activities*. International Journal of Computer-Assisted Language Learning and Teaching (IJCALLT). 7(4), pages 59-73.

- Pineda, J. E. (2018). *Error correction and repair moves in synchronous learning activities.* International Journal of Educational Technology in Higher Education. 15(23), pages 2-17.

- Winner of the Jaclyn Ng Shi Ing Award for Best PhD student Presentation at the XVIIIth International CALL Research Conference at the University of California Berkeley (7-9 July 2017) with the presentation entitled *Learning English at a distance: Exploring the effects of local context on the design, implementation and the learning outcomes of a local experience of learning English.* This presentation was derived from this investigation. The XVIIIth International CALL Research Conference was organized by the editorial board of Computer Assisted Language Learning Journal.

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I would like to thank the Universitat Oberta de Catalunya and the eLearn Center because without their innovative approach to teaching, I would not have embarked on this adventure and I would not have acquired the skills that I have learned. Now, I can say that time and geographical distances are not barriers for knowledge.

Finally, I would like to thank the Universidad de Antioquia, as without their support, I would never have carried out studies at this level. Now, I feel really committed to share all the skills, knowledge, and abilities with my students and I feel obliged to increase the level of quality in the teaching and learning of languages in Colombia, especially, online learning. I also think that it is possible to take quality education to people, regardless of their location.

Abstract

Language teaching is a field in constant evolution and the use of technology has boosted its development. The use of Computer-Mediated Communication (CMC) technologies has broadened the scope of possibilities for teaching and learning languages, offering unprecedented opportunities to learn languages in different settings (face-to-face, blended, or exclusively online), using a variety of pedagogical approaches (task-based language teaching, flipped classroom, technology-enhanced teaching and learning, gamification, etc.). However, this proliferation of technological tools and pedagogical approaches has posed several questions for teachers and researchers, among them how to best integrate technology into teaching (Nguyen & Bower, 2018) and their effects on the learners' target language development. An equally important concern is the role which teacher feedback has in technology-enhanced language learning (Anthony, 2010; Hauck & Stickler, 2006; Yanguas & Bergin, 2018). In exclusively online language learning settings, such as the one in the present investigation, the question of how to provide corrective feedback becomes particularly relevant due to the asynchronous nature of most learning activities in online language courses. Given that immediate corrective feedback is known to facilitate the acquisition of certain grammatical structures (Arroyo & Yilmaz, 2017; S. Li, Zhu, & Ellis, 2016; Shintani & Aubrey, 2016), and that oral skills are highly neglected and consequently are the most challenging to practice in fully online language courses (Ko, 2012; Volle, 2005), this investigation seeks to identify the most common errors that learners do, the correction strategies that a teacher uses and the reactions from learners in interactions in synchronous sessions called online lessons that aim at developing learners´ oral skills and promoting interaction. This investigation analyzes the errors produced by learners, the correction strategies the teacher uses and the subsequent successful or unsuccessful repair moves learners produce during the synchronous learning activities using the error treatment sequence proposed by Lyster & Ranta (1997). Additionally, the frequency

and distribution of learners' uptake (Lyster & Ranta, 1997, p.49) is detailed examining the successive repair moves or lack-of-thereof produced by the learners as a response to their teacher's correction strategies. This allows to give an account of which correction strategies lead to successful repairs. The participants are six Colombian graduate students enrolled in a 20-week fully-online, low intermediate English language course. The findings will have implications for online language instruction given that previous research has identified that teachers need to develop new teaching skills (Compton, 2009; Hampel & Hauck, 2004; Ko, 2012) that are crucial for teaching online language courses whose objective is communication. This is a qualitative case study with a mixed-methods and a Computer-Mediated Discourse Analysis (CMDA) approach that combines qualitative and quantitative research methods. This study takes a theory-driven approach as theory informs different stages of the study: research design, data collection, analysis, and inference (Creswell & Plano-Clark, 2011; Schrauf, 2018). Data for this study come from the teacher-student interactions in synchronous learning activities in the online course, in in-depth interviews with learners and their teacher, a focus group with the learners, and the grades obtained in the oral assessment activities from the course. In order to analyze the learners' oral productions, this study is informed by the error-treatment sequence (Lyster & Ranta, 1997) and it uses the clause as a basic unit of analysis. This investigation identifies the number of clauses containing errors, the number of clauses containing correction strategies and the number of clauses containing repair moves to calculate percentages, means and standard deviations. The analysis of the participation in the focus group and the in-depth interviews is also informed by the error-treatment sequence because this study explores the general opinions of the participants and the level of awareness of error production, the use of correction strategies and the selection of repair moves. The results from the analysis of the in-depth interviews and the focus group served to broaden the scope of the results from the analysis of the oral performances in the synchronous learning activities. The main findings of this

investigation show how language accuracy evolves throughout the course. Most learners produced mistakes at a similar rate and the number of mistakes they made dropped towards the end of the course, something which is also reflected in the language accuracy marks their teacher gave. The teacher tended to provide explicit corrective feedback, which nonetheless went mostly unnoticed by the students. When students realized about the mistake, they repaired it by repeating the teacher correction in the majority of the cases. There is a clear correspondence between the most common types of mistakes learners produced and the most common mistakes the teacher corrected. The results of students self-reported perceptions about the course, the errors they made, and the role of their teacher's feedback reveal that their perceptions regarding the errors they produced coincides with the most common errors they made, and to a large extent also with the type of mistakes and the way their teacher corrected them. According to the learners, taking part in the course, their teacher's help in making them aware of the errors they made and their own reflections about the repair moves, helped them develop a certain level of language awareness, the ability to occasionally self-diagnose errors, and self-confidence to speak the target language.

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1. Introduction

This section of the thesis establishes the context and explains the problem addressed by this study. It gives a brief synopsis of the theories that inform the research design, the collection of data, the analysis of information and the explanation of the findings. This chapter describes the study, the research issues, the sources of data and the main findings. This chapter also outlines some theoretical implications associated with the results of previous research. At the end of this chapter, there is an overview of the structure of the thesis.

Learning English has become a need in this globalized world and Latin America is not exception where being proficient in English is viewed as an advantage and as an attribute that helps people stand out and provides people with access to different work and study related opportunities (Fandiño-Parra, Bermudez-Jimenez, & Lugo-Vasquez, 2012; Gonzaléz, 2009; Pineda Hoyos, 2017). As consequence, several countries in the region have developed and implemented policies that aim to increase English competence among its citizens with the ultimate goal of enabling people to become proficient in English (Gonzaléz & Llurda, 2016). In Colombia, for example, the Ministry of Education has implemented the National Program of Bilingualism (NPB) whose objective is to have citizens that can communicate in English with internationally comparable standards (Ministerio de Educación Nacional, 2006). The NPB has established teaching and learning agendas for primary and secondary education and higher education that focus on English teachers and students and on pre-service language teaching programs and academic programs in general. These nationwide policies have generated language policies at local levels. For example, the institution where this experience took place, issued a language policy that established that its students have to take 320 hours of English instruction before graduation for undergraduate studies. The policy also states that learners should reach a B1 level at the end of the learning cycle as explained by the Common European Framework of Reference (Council of Europe, 2001). The policy establishes that the courses are

offered in three modalities: face-to-face, totally online or blended (Universidad de Antioquia, 2014). In addition, the institution seeks to promote pedagogical and educational innovations to align the institution to global and local dynamics that situate it in the forefront of the digital advances (Universidad de Antioquia, 2018).

Besides the regional and the institutional policies to promote English language learning and the policies that promote educational innovations, the technological landscape in the region has grown as well. For example, it is estimated that there are about 428 million inhabitants in Latin America and 308 millions of them have access to the internet, which means that internet has a 72% penetration rate in the region, which is higher than the penetration of internet in the rest of the world (52%) (https://www.internetworldstats.com/stats2.htm). In Colombia the landscape is similar, there are almost 50 million inhabitants and as for December 2017, it is estimated that there are 31 million internet users, which is a 63% penetration rate and as for March 2016, it is estimated that there are more than 57 million mobile phone subscription, which is a 117% penetration rate (Departamento Nacional de Planeación, 2018). In addition to that, there have been major developments of Computer-Mediated Communication (CMC) tools that facilitate communication between people via the instrumentality of computers (Hampel, 2014), thanks to the development of synchronous technologies, which use audio and video and favor communication in real time (Oztok, Zingaro, Brett, & Hewitt, 2013) that are not necessarily used for educational purposes (Facebook Live, Google Hangouts, Zoom, Skype). Additionally, synchronous technologies-when used for educational purposes-have proven to provide learners with opportunities to develop reading, listening, and speaking skills and favor communication and language learning from a socioconstructivist perspective (Anderson, 2016), which is the perspective that this experience takes when designing language courses.

As the combination of policies that encourage pedagogical innovations in the teaching and learning of English, the favorable technological conditions and the development of CMC

tools that have stimulated the proliferation of English language learning options that include different approaches, modalities and technologies, research has identified several issues that need special consideration. First, how the use of technology reshapes teachers' pedagogical practices as a lot of research concentrates on solving problems with the media rather than its pedagogical role (Oztok *et al.*, 2013). In fact, different studies suggest that there is a growing concern about adjusting language pedagogy to the advantages and disadvantages of online environments, as well as a growing concern to design adequate tasks or activities to teach languages online (Anthony, 2010; Hampel, 2006; Rosell-Aguilar, 2005). On top of that, other studies have unveiled several benefits of the use of technology for language teaching and learning. For example, technologically-mediated communicative tasks produce more talking time (Gleason & Suvorov, 2011), they stimulate communication (Offir, Lev, & Bezalel, 2008), they develop skills that go beyond the command of language structures, such as, the development of language awareness and the ability to self-diagnose errors (Yilmaz, 2011). Second, the mediating role of technology in the development of oral proficiency and the development of linguistic features of learner's speech (Hirotani, 2009), the type of responses of learners and teachers when language errors appear, and the type and quality of feedback (AbuSeileek & Qatawneh, 2013). Apart from that, research has highlighted that communicative focus on form in online settings needs to be further explored (Anthony, 2010). As a matter of fact, research suggests that corrective feedback should be utilized in a social context (Blake, 2009; Nassaji, 2007) as error correction is often the result of a dialogical interaction between learners or between learners and the teacher. Third, research has identified a need to deepen into expanding the scope of understanding how syntactic complexity, lexical range, accuracy, fluency and the provision of feedback occur when teaching and learning English online (Lin, 2014; Ortega, 1997).

The difficulty of analyzing all these issues in one single study, together with a growing need to analyze the development of language accuracy (Ahmadian & Tavakoli, 2011; Vinagre & Munoz, 2011) justifies taking the use of corrective feedback and the development of language accuracy in an online setting to the forefront in the present research. Based on Lyster & Ranta's (1997) model developed in the error-treatment sequence, this study seeks to identify the type of errors that learners produce, the type of correction strategies that the teacher employs and provides an account of the learners' production of repair moves these strategies prompt during synchronous learning activities. Moreover, the study aims to describe the development of language accuracy in the oral speech of learners of English as a foreign language. To explore these issues, this investigation follows a case study with a mixed methods and a Computer-Mediated Discourse Analysis (CMDA) approach that combine both quantitative and qualitative research methods. The research data in this study are drawn from three main sources: (1) recordings of the synchronous learning activities (online lessons and online interviews), (2) a focus group and in-depth interviews with learners and the teacher, and (3) the participants' grades obtained in the oral assessment activities in the online course.

In order to analyze error production in the synchronous learning activities, the study uses the clause, understood as an utterance that contains a finite verb, as the basic unit of analysis. This research uses the number of clauses containing errors, the number of clauses containing correction strategies, and the number of clauses containing repair moves as measures of accuracy. Those measures are calculated looking for percentages, means and standard deviations.

With the purpose of expanding the scope of understanding of the production of errors, correction strategies and repair moves and also informed by the error-treatment sequence, the present study analyzes the insights from the participants in in-depth interviews and a focus group looking for general and specific themes that emerge from them and it incorporates the

participants' grades by examining their performance in the assessment activities in the online course, calculating means and standard deviations.

The main results of this investigation describe the improvement in accuracy levels of most learners, evidenced in the decreasing number of mistakes learners made towards the end of the course and in the steady increase of language accuracy marks their teacher assigned along the course. Learners' language accuracy developed in part due to the teacher's provision of explicit corrective feedback. A closer analysis of the most common mistakes learners produced reveals an expected correspondence between these and the most common mistakes the teacher corrected.

Participants self-report the development of certain level of language awareness, the ability to self-diagnose errors, and the self-confidence to speak. The synchronous learning activities provide instances to correct errors as soon as they appear, as well as provide opportunities to communicate with the teacher and peers, whereas the utilization of correction strategies and the use of repair moves are regarded as positive because they help to notice and correct errors.

The context of this investigation is an online course of English that is framed on an institutional initiative to comply with national language policies and whose objective is to develop particularly oral skills. The course is designed for students who have an elementary level of English (A2 to B1 according to the Common European Framework (Council of Europe, 2001)), it has online learning activities that are mediated by synchronous and asynchronous communication technologies, but this investigation focuses on the synchronous learning activities. The online learning activities in the course contain tasks or activities that the students have to carry out orally. Additionally, the online learning activities are equipped with tutorials, guidelines and other resources designed to help participants navigate them. Although the course was not originally designed for this investigation as it was part of an institutional language

learning offering, its characteristics and elements motivated the analysis of the development of oral language accuracy and the role of corrective feedback.

This thesis is composed of seven sections. Section one introduces the study — it includes the problem addressed, the research issues to be explored, the nature and structure of the study, a brief synopsis of the main concepts in this study, and a short summary of the findings. Section two explores the review of literature, which includes the main concepts that inform this investigation and also explores and discusses the recent studies on the use of CMC technologies to teach languages. Section three mentions the research questions and objectives. Section four explains the methodology employed in the study including the research design, the data collection procedure, the data treatment, and the analysis of the data. Section five explores the results of the investigation. Sections six covers the explanation of the results, and section seven deals with the conclusions of the study as well as the limitations and the possibilities for future research.

2. Literature review

The previous chapter explained that research has surfaced the need to carry out studies that describe the development of language accuracy in synchronous learning activities. It also showed that there is an emerging need to explore the use of corrective feedback when teaching languages online. At the end of the section, there is an explanation of the nature and structure of this thesis.

This section incorporates the analysis, synthesis, and significance of the main concepts and theoretical approaches that frame this study. From a critical perspective, this section provides evidence from other studies that shows how these concepts have been explored and what conclusions have been drawn from them.

2.1 Trends in English language teaching

In order to understand the reasons that motivated this investigation, it is necessary to explore different trends in English language teaching that inform the design of the research scenario of this study. The online course of English that is the research scenario of the present investigation shows the tension that has been present in English language teaching for a long time between the desirability of communicative use of the language and felt need for a linguistic focus in language learning (Lightbown & Spada, 1990; Long, 1991). This course broadens the scope and updates the tension as it includes the aspect of focus on form in communicative courses in online settings and this tension becomes the motivation to analyze the development of language accuracy, corrective feedback and learner uptake (Arroyo & Yilmaz, 2018). Although there is a clear distinction between the research scenario and the methodological research design of the present study, an exploration of the origins and the theoretical basis of the research scenario is worth mentioning to understand how the course influences and motivates the study. This section explores the influence of Second Language Acquisition (SLA) research on language teaching, the early attempts to find *the* method for teaching and learning English, going from the direct method to communicative methods. This section explores the concept of Task-Based Language Teaching (TBLT) as that is the approach on which the course that is the research scenario of this investigation is based. And at the end, this section explores Content-Based Language Teaching (CBLT) and Content and Language Integrated Learning (CLIL) as approaches that emerge from TBLT.

English language teaching has been greatly influenced by Second Language Acquisition (SLA) research. According to Long (2012) SLA includes non-native and native language development by children or adults in natural settings or in settings of formal instruction. Long claims that SLA encompasses different learning situation such as learning in groups or individually, second language, foreign language or lingua franca. He suggests that the "Second"

in SLA includes a third, a fourth or more languages, , "Language" includes dialects or teaching specific languages such as English language teaching and "Acquisition" includes learning, attrition and loss.

Historically, based on results from SLA research, English language teaching has searched for *the* method to teach English and several methods have emerged such as the Direct Method, the Audiolingual Method, the Cognitive-Code Learning Method and in the seventies, Community Language Learning, the Silent way, Suggestopedia and the Total Physical Response (TPR) (Brown, 2002). But English language teaching scholars and practitioners concluded that there was and probably never will be a perfect method and the focus has changed to classroom tasks and activities (Nunan, 1989). That realization marked a new era in English language teaching research and in the profession and a number of studies have investigated tasks and the concept of tasks has evolved over time. Research has defined tasks as a piece of work undertaken for oneself or others, work plans, a piece of classroom work that involves learners in comprehending, producing and interacting in the target language and its attention is primarily focused on meaning rather than form. Tasks are goal oriented activities in which learners use the language to achieve a real outcome (Ellis, 2003; Hismanoglu & Hismanoglu, 2011).

Research has also unveiled different characteristics of tasks. Tasks should contain natural language, the activities inserted in tasks should be related to meaning rather than form, instructions should be learner-centered and tasks should provide opportunities for students to focus on certain linguistic components, tasks should have a positive impact on learners and they should be practical for teachers (Hampel, 2006). However, tasks can be focused on form. Mennim (2003) draws our attention to the following processes when focusing tasks on form. (1) tasks encourage learners to attend to the language forms that they are using or are exposed to, (2) tasks help learners notice ways in which their interlanguage differs from the target

language, (3) tasks help learners rethink their own hypothesis about the target language and (4) tasks help learners, subsequently, modify their output in a target-like direction. Table 1 summarizes the characteristics and processes of tasks.

Characteristics and processes of tasks
● Natural or naturalistic language ● The activities should be related to meaning rather than form ● Instruction should be learner centered rather than teacher centered ● Provide opportunities for students to focus attention to certain linguistic components as they appear in lessons (swan, 2005 in Wang & Winstead, 2016) ● Have a positive impact on learners and it should be practical for teachers (chappelle, 1998) (as cited in Hampel, 2006) ● Interactive and include reporting back of the communicative outcome (Skehan, 2003) ● Collaborative, interesting, rewarding and challenging (Meskill, 1999) ● Meaningful and engaging (Oxford, 1990) ● Provide opportunities to produce the target language (Chapell, 1998) ● Make use of authentic material (Little, 1997) ● Be appropriate to the medium used (Furstenberg, 1997) (as cited in Rosell-Aguilar, 2005) Processes involved in tasks when focused on form: 1. Encourage learners to attend to the language forms that they are using or are exposed to. 2. Tasks help learners notice ways in which their interlanguage differs from the target language. 3. Tasks help learners rethink their own hypothesis about the target language 4. Tasks help learners modify their output in a targetlike direction (Mennim, 2003)

Table 1. Characteristics and processes of tasks

Tasks are divided into categories; information-gap tasks, reasoning gap tasks, opinion gap tasks. There are tasks in which students have to list or brainstorm information, order or sort items, match, compare or find similarities among items. There are other tasks in which participants have to solve problems, share personal experiences or tell a story. (Hismanoglu &

Hismanoglu, 2011; Lai, Chun; Goufang, 2011). Figure 1 shows the different types of tasks.

information-gap tasks	reasoning gap tasks	opinion gap tasks	brainstorming tasks	ordering tasks	matching tasks	comparing tasks
involve the transfer of inforrmation	involve deriving information through inference	involve identifying and articulating a preference, feeling or attitude	involve listing people, places, thing, etc	involve sequencing, ranking or classifying	involve putting together two or more things	involve finding similarities and differences

Figure 1. Different types of tasks

Ellis (2003) points out that many designs have been proposed to implement tasks in English language teaching, but they all have in common the following components, which are the same components that the synchronous sessions, that are the research scenario of this investigation have:

(1) a pre-task stage that refers to the activities that take place before the task. For example, listing, brainstorming for ideas, ordering or sorting elements. This stage is suitable for introducing vocabulary that may be unknown and that would appear in the following stage. This stage can also be used to introduce a topic, to activate background knowledge and to introduce vocabulary or structures that can be difficult and to give time and elements to plan the performance of the task.

(2) a during task or while task stage that centers on the task itself and includes numerous activities such as matching captions, texts, pictures, expressions, answer comprehension questions, etc. This stage has to do with doing something with the information from a reading, an audio or a video text. This phase includes aspects such as time pressure to perform

(3) a post-task stage that involves procedures of following up performance. This stage has to do with doing something with the information from the other two stages. This stage includes activities such as comparing results, problem-solving tasks, role-plays and more

complex activities such as arguing, giving opinions or sharing personal information. Although, in the lessons based on tasks only the while task phase is mandatory, the online lessons (synchronous sessions) designed for this study contain activities for the three stages because they play a crucial role in ensuring that the task performance is maximally effective to develop language accuracy and the effects on correction strategies and repair moves is greater. Figure 2 illustrates the task cycle employed to design the online lessons in this study and the type of activities that they contain.
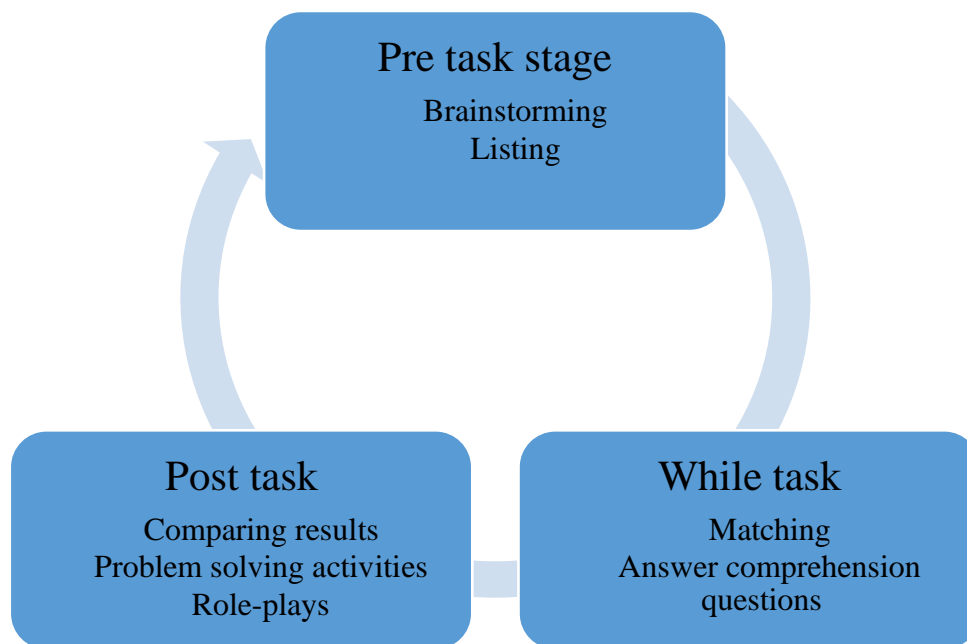
Figure 2. Cycle employed to design the lesson and the activities in each stage

The focus on tasks and activities and the focus on meaning rather than form have played a central role in English language teaching that have generated other approaches to teach English. One of those approaches is Content-Based Language Teaching (CBLT). This approach states that language can be best learned through subject content. It includes various models to implement content-based instruction: theme-based language instruction, shelter content instruction and adjunct content instruction. Some of the benefits of CBLT is that it aims at eliminating the artificial separation between language instruction and subject matter classes.

CBLT also furthers the goals of language teaching by offering context for language and CBLT bring together both subject and language learning as simultaneous processes, but with distinct concern for both subject and language learning aims (Creese, 2006; Jalilzadeh & Tahmasebi, 2014; Shabani & Ghasemi, 2014).

Another approach to English language teaching and learning where teaching content, teaching language and tasks can go together is Content and Language Integrated Learning (CLIL). CLIL refers to educational settings where a language other than the students' mother tongue is used as a medium of instruction. CLIL is expected to give a communicative purpose to the use of the foreign language. The advocates of CLIL claim that both foreign language and content capacities develop more efficiently and effectively, while the opponents of CLIL argue that whether the foreign language development enhances, while the content does not or vice versa. The adoption of CLIL pedagogies has seen an increase in Europe and Latin America because it represents to move from monolingual education systems to bilingual ones, or from bilingual systems into multilingual ones (Bruton, 2013; Martínez Agudo, 2019; Pérez Cañado, 2018). The previous approaches to teach English highlight meaning over form. They show that tasks can be combined with other approaches. In conclusion, the approach to language learning and teaching that this study has is the socio cultural approach as it prioritizes language use in context, contrary to traditional cognitive approaches that focus on modelling language structures (Xiao, 2017).

An example of the use of tasks for the development of language skills is this study by Yanguas (2018) where he explores if task type has an effect on the number, focus and outcome of language-related episodes (LRE) in synchronous communication (video and audio). In his investigation, 78 intermediate Spanish learners participate. His study focuses on jigsaw and dictogloss tasks. His findings show that the tasks and oral modes produce no significant differences in the number of LREs produced by learners and both type of tasks (jigsaw and

dictogloss) in either mode (video or audio) led learners to produce a similar number of LRE. His findings also reveal that learners' main concern is vocabulary when performing jigsaw and dictogloss tasks. In his study, learners produce a significantly higher number of lexical LREs in the jigsaw task and a higher number of grammatical LREs in the dictogloss task. Yanguas' study reaches two conclusions that highly relate to the focus and objectives of the present study. First, it appears that the oral nature of the interaction might mitigate potential task effects. Second, learners focus on form and produce LREs when interacting in the target language in video and audio communication. Yanguas' study and conclusion is very relevant for the present study as it shows the effects of different types of tasks for language teaching and learning and it shows that tasks are a feasible methodology to be used in combination with technological tools.

The following sections show how the blend between tasks and technological resources to create new learning environments. The section explores Computer-Mediated Communication (CMC), synchronous communication, the theoretical basis and some related concepts of CMC and their consequences for teaching, at the end of the section, there is an exploration of some studies on the use of CMC, a discussion of their findings and some examples of the use of synchronous tools to teach.

2.2 Computer-Mediated Communication (CMC): definition and components

The advent of technology and the development of Computer-Mediated Communication (CMC) tools have influenced very positively English language teaching and learning because they provide opportunities for learners to interact with speakers and other language or learners who can be in distant places, they also facilitate collaborative and comprehensible interaction by offering occasions of learner-centered interaction. Besides, CMC stimulate learners' interests, they encourage peer learning and they decrease dependence on the instructor. CMC has shown that they blend very well with tasks and teaching activities that promote

communication (Hosseini, 2015; Koivistoinen, 2008; Mahdi, 2014). Before analyzing the concepts and theories behind the use of CMC, it is necessary to explore its definition and benefits. Different definitions of the term Computer-Mediated Communication (CMC) exist in the literature. For example, Hampel (2014) defines CMC broadly as communication that takes place between people via the instrumentality of computers. To date, several studies have identified the advantages of incorporating CMC tools for both students and teachers. For example, Peters & Hewitt (2010) acknowledge that students feel attracted to CMC tools because they offer the flexibility of learning at times and places of their choice and teachers value their collaborative potential. Additionally, CMC tools provide a democratic space where participants have equal opportunities to take part in a course. In the case of this investigation, to practice English orally. Moreover, the shared social nature of CMC tools increases the personal motivation and fosters critical reflection among participants (Peters & Hewitt, 2010). Similarly, Abrams (2003) acknowledges that CMC tools help learners to feel more involved in the development of ideas, in determining the path of topics, as also in the selection of those topics.

Computer-mediated communication tools play an important role in this investigation because, as technological developments in the field of CMC, which include audio and video in real time, are recent, written communication has dominated the field of CMC technologies, which has generated that most of the research has been done on written CMC, and research in the field of CMC using video and audio orally is still scarce. Previous studies show that the use of video and audio conferencing as CMC tools in language learning can foster collaborative learning through social interaction both with tutors and peers (Hampel & Hauck, 2004). Rosell-Aguilar (2005) states that CMC facilitates communication, understanding, and interaction with software that is enriched with text, images, whiteboards, and text-chat facilities. To sum up, CMC is any communication that takes place using computers. It offers flexibility for learning, it has great collaborative potential, it provides a democratic space. CMC also increases

motivation and critical reflection, it helps learners develop ideas, determine topics and helps learners establish the sequence to study those topics. Finally, CMC fosters interaction with tutors and peers and with software that is enriched with text, images and sound. Figure 3 shows the definition of CMC and its components.

Flexibility Collaboration	Motivation Critical Reflection
CMC COMMUNICATION THAT TAKES PLACE USING COMPUTERS	
Development of ideas Selection of topic	Interaction with tutors - peers and enriched software
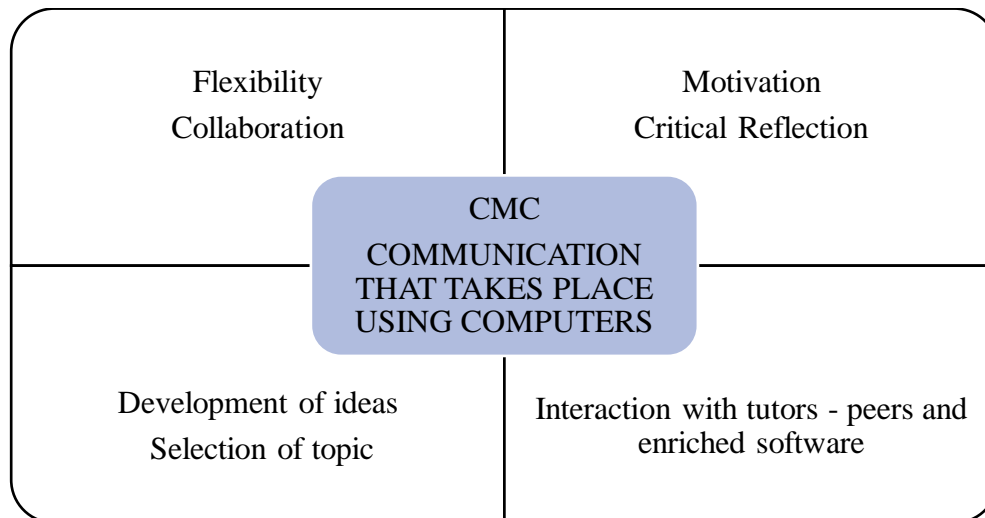
Figure 3. CMC definition and components

2.3 Synchronous communication

Computer-mediated communication can be classified on the basis of the synchronicity of the communication. Oztok *et al.* (2013) define asynchronous communication as communication that occurs in delayed time and does not rely on simultaneous access for educational outcomes, and synchronous communication as communication that involves real-time communication between teachers and students. AbuSeileek & Qatawneh (2013) argue that asynchronous communication may give users more chance to think and answer, while synchronous communication requires immediate responses, which limit the use of outside resources.

AbuSeileek & Qatawneh (2013) point out that CMC can pursue different purposes in language teaching. For example, asynchronous communication can serve to learn a specific grammatical structure, whereas, synchronous communication can serve to enhance linguistic

interaction and foster a contact between different groups of learners. Synchronous communication can help produce large amounts of output because it enables extensive learner-to-learner negotiation and more talking time per learner than face-to-face communication. Gleason & Suvorov (2011) and Lee (2011) identify other advantages of CMC in promoting communication, interaction, and socialization, which table 2 summarizes.

Table 2. Advantages of CMC in promoting communication, interaction, and socialization

CMC has been found to	Provide frequent opportunities to express ideas and opinions
	Produce a large amount of target language output
	Allow more time to develop comments
	Lead to greater precision of expression or greater accuracy rates
	Promote a collaborative spirit
	Enhance motivation of language practice
	Promote a student-centered atmosphere
	Reduce students' anxiety
	Develop students' linguistic performance

2.4 Computer-Mediated Communication (CMC): theoretical basis, related concepts and consequences for teaching

Technology and specifically computer networks have boosted the development of several aspects of society and language teaching is no exception. The developments of computer technology have created new opportunities for language learning that cannot be found in traditional classrooms (Mahdi, 2014). Moreover, the development of computers and the use of the Internet have turned into a very important communication media that has been used effectively to a variety of purposes including pedagogical ends (Hosseini, 2015). Therefore, an exploration of the theoretical background behind the use of these technologies in language teaching deserves attention. This section explores the theoretical basis of CMC, it explores its benefits and the consequences of those concepts when teaching languages online.

A seminal study that illustrates the theoretical basis of CMC is Kern (1996) where he presents a rationale for establishing content-based e-mail exchanges. He begins by using Vygotsky (1978) and Bakhtin's (1986) claims to explain that social interaction plays an

important role when learning a language in face-to-face settings. He states that learners benefit most from social interactions concerning tasks that they cannot do alone, but that they can do in collaboration with more knowledgeable or more experienced individuals. For him, utterances are constructed on the basis of the speakers' past interaction with the thoughts of others and in anticipation of a responsive reaction from some specific or generalized other. Therefore, Vygotsky and Bakhtin's theories highlight the importance of social interaction in understanding and learning and can help reconceptualize the role of computers in language teaching as those theories suggest that computers have to be viewed as a means to connect with other individuals, where people can ask questions, provide explanations, compare interpretation and work collaboratively, rather than viewing the computers as a kind of substitute for the teacher, who only provides drills, tutorials and reference material. Kern (1996) argues that the use of computers in language teaching has to move from a computer as agent perspective in which the learner has a one-on-one relationship with the computer and human interaction is only simulated, to a computer as medium perspective in which computers reorganize interactions among people. He goes on suggesting that to move from a computer as agent perspective to a computer as medium perspective implies that teachers and learners use the computer as a channel through which to communicate collectively and/or individually and teachers play the role of guides and provide a scaffold for their students' learning with their own knowledge and experience (Kern, 1996).

Another seminal study that explores the theoretical basis of the use of computers in language teaching is Warschauer (1997) where he proposes a conceptual framework to explore the nature of computer-mediated communication. His first perspective comes from Krashen's (1999) input hypothesis that states that the development of a second language is wholly dependent on the amount of comprehensible input that one receives. He points out that this perspective is useful to understand both classroom and computer-mediated interaction.

However, he says that this perspective still lacks to explain how students use language related collaboration to become competent members of a speech community, to gain important cultural knowledge or content matter or to develop literacy critical thinking skills. Warschauer's (1997) second perspective to explore the nature of computer-mediated communication is the sociocultural perspective. As Kern (1996), he states that the sociocultural perspective creates an environment to learn the language, learn about language and learn through the language. This perspective examines interaction within a broad social and cultural context. Warschauer (1997) claims that according to Vygotsky, language is one of the tools that mediates purposeful action that allows human learning and development to take place. He states that all higher order functions develop out of language-based, social interaction.

Warschauer (1997) employs also illuminated by Vygotsky, uses his concept of the Zone of Proximal Development (ZPD), which is the gap between what the learner could accomplish alone and what he or she could accomplish in cooperation of others who are more skilled or experienced, to stress that collaborative learning is essential for assisting students in acquiring knowledge. He claims that there are two main interpretations on how learners travers through the ZPD: (a) modeling in which the teacher models an approach to the learning and (b) text mediation in which texts are considered as thinking devices that generate new meaning collaboratively. He suggests that the text mediation perspective has been well developed by educators. In this model, the teacher assists as a guide and students collaborate to make connections between new ideas and prior knowledge, they use the language as a tool for learning and develop linguistic and thinking skills.

In another seminal study that covers the theoretical basis of the use of computers in language teaching, Ortega (1997) evaluates the potential benefits of computer assisted classroom discussion in relation to second language acquisition theory and she claims that the introduction of networked computers into education coincides with a shift in education from

cognitive and developmental theories to social and collaborative views of learning. She also claims that it is necessary to change the way we perceive the use of computers in language teaching as we need to view them as a new medium that changes the way we write, read and possibly think. Indeed, she claims that we need to broaden the scope of understanding to determine in which ways language, learning and interaction have been transformed by the use of computers in education. In her study, Ortega (1997) explores the blend between computers and language teaching and learning and identifies several reasons why the blend is a promising area of research. Interestingly, although she identified those reasons 20 years ago, they still prevail and can inform research in language teaching in online environments today. Ortega (1997) points out that conducting discussions on a computer entails meaningful use of the target language and forces teachers and students away from treating the language as an object rather than as a medium of communication. She claims that it also promotes a task and interaction-driven approach to L2 learning and teaching, which can be used as a basis for new curriculum design and it provides opportunities for language development since students are motivated to broaden their language resources to meet the demands of real communication in a social context. Ortega (1997) singles out other benefits of carrying out discussions in computers such as learners contribute as much as they want at their own pace, learners engage in a variety of interactive moves on the computer and they take control of the discussion, learners have time to plan their messages and edit them and learners are exposed to a substantial amount of comprehensible input. She claims that more and more voices in the education and technology literature endorse that computers per se are beneficial or harmful, it is the use that we put them to that determines how useful they can be.

In her study, Ortega (1997) emphasizes that research in the use of computers in language teaching have focused on three main areas: (1) computers have an equalizing effect on participation. That is, computers allow for an equal participation because opportunities for

contributions are more equally distributed among participants and this leads to three effects. First, the traditional view of the teacher as authority source or expert is subverted because he turns into a participant. Second, learners are afforded the opportunity to engage in self-generated, personally relevant communication and third, participants take part in discussions more equally and learners who do not participate very often in classroom settings seem to increase their participation in electronic modes. (2) computers increase learners' productivity in terms of overall amount of language and/or ideas produced. Ortega (1997) claims that quantity of linguistic production rather than quantity and quality of ideas has been of central interest in research on the use of computers and language learning. She states that the use of computers in language learning generates opportunities for communicative practice of the target language and opportunities for meaningful learner output. (3) the language produced in electronic discussions can be more complex and formal than in face-to-face discussions. This is the area of electronic discussions of most interest to evaluate their effects and to establish links with L2 development.

In her seminal study, Ortega (1997) establishes the *new* directions for research on the use of computers and language teaching, which are very useful and relevant for the present study. She states that there are at least two aspects of production that need to be investigated. First, the interlanguage produced over time in electronic discussions in terms of quantitative measures of syntactic complexity, lexical range, accuracy and fluency and the provision of negative feedback. Second, qualitative and quantitative analysis of interactional features such as interactional modifications of input (clarification requests, comprehension and confirmation checks, repairs, self-repairs, recasts and other forms of corrective feedback, and incorporation of others' input in learner output). She also suggests that there is a need to investigate the impact of computers on the development of various components of communicative competence and of the different language skills as well as affective variables such as attitudes towards writing or

speaking with computers or computer anxiety or learner aptitude or experience with computers or computer skills. She claims that another area of potential research in computers and language learning is the use of learner strategies in particular metacognitive strategies such as planning or monitoring. Finally, she suggests that the combination of observation, self-report data collected through questionnaires or interviews, and computer-collected data (both linguistic and nonlinguistic moves) as it is the case of the present study, enhances the internal validity of the studies and enables a more accurate assessment of the ways in which the use of computers fosters learning and communication strategies and of the impact of such strategies on second language performance in the electronic mode. She claims that establishing links between self-reported and observed behaviors and linguistic outcomes should be a priority in research of the use of computers in language learning and teaching as it is the case of the present study.

Another seminal study that paved the grounds of research on the use of computers in language teaching and that enlightens the present investigation is Kern (1995). In this study, he compares the quantity and characteristics of discourse produced by two groups of students who participate in an oral class discussion using synchronous interaction and at the same time, he explores the participants' impressions about the advantages and disadvantages of using the synchronous tool. In this investigation, he employs *InterChange,* which is a tool that allows students to engage in collaborative, written discussions. In this early paper, Kern (1995) observes that after using *InterChange*, its use stimulates responses that introduce a number of topics, it gives public voice to students' feelings and establishes a sense of solidarity. Its use is simultaneously informative for learners who only read and do not contribute to a particular discussion. Kern (1995) notices that the use of a synchronous tool for discussion has effects on teachers. He points out that unlike traditional settings where classroom discourse consists of a teacher-initiated topic, followed by a reply from students and a teacher evaluation of the reply, when using *InterChange*, the pattern changes as messages are directed to the entire group or to

a specific addressee, but they are rarely produced from a teacher request. In other words, the teacher does not allocate the floor, which is available to all group members at all times. Another difference when using a synchronous tool when compared with a face-to-face setting, according to Kern (1995), is that participants' fully elaborated turns can take place simultaneously, unlike conversational discourse where speakers' turns follow one another sequentially. The kind of talk produced by learners in *InterChange* tends to be metalinguistic or metadiscursive.

The use of *InterChange* for having synchronous discussions affords more frequent opportunities for leaners to express their ideas, greater amount of language production, more time to develop and refine comments, encouragement of a collaborative spirit and enhanced motivation for language practice and reduction of anxiety (Kern, 1995).

Kern (1995) concludes that *InterChange* offers more frequent opportunities for students' expression that lead to more language production. The language level of students was more sophisticated in terms of morphosyntactic features and in terms of variety of discourse functions. There was an indication that the use of *InterChange* reduced communication anxiety. This study reveals that the role of the teacher is compromised and grammatical accuracy suffers and learners can be exposed to defective language because formal accuracy, stylistic improvement, global coherence and reinforcement can be difficult to achieve. Contrastingly, *InterChange* seems to foster these aspects: self-expression, student initiative and responsiveness, generation of multiple perspectives on an issue, voicing of differences, and status equalization.

All those early studies inform the present investigation because they show that the use of computers in language teaching is based on sociocultural perspectives where interaction and collaboration play a crucial role to construct meaning, understanding and learning. These studies suggest that the use of computers in language teaching need to be reconceptualized as they have to be viewed as a means of communication rather than a simple repository of

information. They also show that the use of computers in language teaching entails meaningful use of the target language and encourage teachers and learners to view the language as a medium of communication rather than an object itself. These early studies point out that the use of computers in language teaching promote a task and an interaction-driven approach and learners need to meet the demands of real communication in a social context. Furthermore, these studies identify that the use of computers in language teaching has an equalizing effect, it increases learner productivity and the language can be more complex and formal than in traditional settings. These studies show that research in the area of computers in language teaching should focus on expanding the scope of understanding of its effects on syntactic complexity, lexical range, fluency, and as it is the case of the present investigation, accuracy and the provision of feedback. These studies also suggest that to enhance internal validity of studies in the area of computers and language teaching, it is necessary to combine observations and self-report data with computer-collected data. Finally, these early studies show that computer-mediated discussion offers a powerful means of restructuring the teaching of languages, they suggest that computers in language learning can be used to facilitate human communication by linking learners and teachers in new and productive ways. The present investigation is aligned with the suggestions from these seminal studies because it seeks to broaden the scope of understanding of the development of oral language accuracy and the provision of feedback in synchronous learning.

More recently, other scholars have provided new theoretical perspectives to the field of Computer-Mediated Communication. In an essay where there is a chronological depiction of the development of concept of CMC, Thorne (2008) provides an overview of Computer-Mediated Communication (CMC) in which attention is given to CMC language educational issues and context of use. Thorne (2008) begins by claiming that CMC starts with the internet, but also emerges from a long line of mediated communication technologies such as the printing

press, the telegraph and radio, the telephone and television. He establishes a link between CMC research and linguistic and communication theory and he states that at the beginning CMC was described as inadequate for many task-related needs and ineffective for interpersonal exchanges because of the limited social information available within text-only environments. Fortunately, this view was reassessed later as he notes that CMC relationships can be as, or more relational than those that take place in face-to-face settings. Thus, CMC interaction is not different than face-to-face communication, but typically involves a slower rate of social information exchange. And now CMC is conceived as a viable medium for educational, interpersonal and informational functions (p. 3).

Thorn (2008) states that CMC major contributions start from the early to the mid-1990s when the use of synchronous CMC (SCMC) or chat formed the basis for many SLA studies (see the studies above). He claims that during this time a number of studies have adopted the interactionist SLA model designed to analyze negotiation of meaning in oral interactions and have applied it to CMC research. For Thorne (2008), although much of the research on CMC that took place during this period of time concentrated on the comparison between SCMC and face-to-face instructions, some studies explored crossmodality transfer between spontaneous Synchronous Computer-Mediated Communication or SCMC and oral L2 language production and they found that SCMC has a facilitation effect that lowers the cognitive demand of L2 language production and enables students to produce more complex language. Thorne (2008) states that there are new possibilities of inquiry that include emerging CMC tools that support the combination of text and voice communication that may prove as a promising learning environment as it is the case of the present study.

Thorne (2008) envisions that there will be great developments of CMC tools. He claims that wikis, blogs, podcasting and gaming will be in the forefront of CMC research. He argues that because of the development of technologies that support the broad distribution of sound,

video and compilations of media, new digital environments will emerge. Some examples of those new environments are audio blogs, video blogs or vlogs, virtual environment games and virtual immersion massive multiplayer online games. This investigation is framed on his predictions as it uses synchronous learning activities that are the result of the development of video and audio technology (Rosell-Aguilar, 2005).

Despite all the benefits of CMC tools, Thorne (2008) outlines two challenges to use CMC in education. First, internet is not a neutral medium, which implies that internet technologies will have many changing meanings and uses for different communities, which makes the use of internet technologies a more complex, but vibrant activity. Second, internet has generated an amplification of the generation gap between the pedagogical processes that operate in formal learning environments, which usually have a top-down direction and the life experiences of learners which have an effect on their educational experiences.

Thorne (2008) concludes that internet communication has permeated business and work life as many activities are carried out using synchronous and asynchronous tools and now, if done appropriately, educational activities can benefit from these technologies as e-mail, threaded discussions, chat, blogs and wikis and advances in audio and video that allow for the development of computer generated and computer-mediated communication are increasingly being incorporated into general education and L2 courses. However, the incorporation of mediated forms of communication is not intended to valorize internet use as positive or superior to other forms of communication. Rather, these new forms of technologies will open the door for changes at the classroom level and will prompt curricular innovations. This assertion is relevant for the present investigation as it does not depict a comparison between the development of oral language accuracy and the use of corrective feedback and repair moves in online and face-to-face settings, instead the present research focuses on the description of the development of oral language accuracy and the use of corrective feedback in synchronous

learning activities, portraying new horizons on how to improve language learning and teaching processes in online environments.

Other scholars have contributed to the theoretical background of the use of CMC in language teaching. For example Chun & Plass (2000) explore the use of networked hypermedia environments that besides presenting the learner with information in several modes (visual, audio and verbal/textual), they also require learners to engage on productive tasks. Those environments include synchronous methods of learner collaboration and they employ video, images, sound and text for the presentation and negotiation of information. They state that the use of networked environments in language teaching poses questions about their design that differ from the traditional design of text-based and stand-alone system that have been used traditionally in language teaching. They stress that language instructors have not considered the necessity of integrating interface design in networked environment with underlying principles of language acquisition in the development of web-based materials.

Chun & Plass (2000) explain that the availability and use of technologies that support computer-assisted language learning (CALL) and Computer-Mediated Communication (CMC), together with current approaches and methodologies for teaching second languages that reflect that there is a new emphasis on developing competencies that go beyond the linguistic/grammatical domain, for example, issues of coherence, cohesion and rhetorical organization, raise the question of whether or not there is a paradigm shift on how languages are taught and learned. They claim that the internet provides ideal communication tools and networking tools in which people can convey thoughts and negotiate with others, which makes the internet useful for second language acquisition. However, the problem is to design learning environments that take full advantage of the technology capabilities while remaining firmly grounded in principles of language acquisition.

According to Chun & Plass (2000) when designing learning activities for networked environments, it is necessary to consider the following aspects that take us back to the theoretical principles of CMC and language teaching: (1) a constructivist approach, which describes learning as a process in which the learner builds and internal representation and interpretation of knowledge by internalizing and transforming new information. (2) Use a process-oriented approaches, rather than a product-oriented approaches because process-oriented approaches are very much in accordance with constructivist approaches to learning and they emphasize the development of communicative language proficiency. (3) Consider the four general features of the World Wide Web: the universal availability of authentic materials, the communication capabilities through networking, the multimedia capabilities and the nonlinear (hypermedia) structure of the information. Chun & Plass (2000) claim that activities that follow these process-oriented approaches can potentially enhance language learning by facilitating comprehension in listening and reading and they provide opportunities for learners to construct and negotiate meaning in speaking or writing.

In the same vein, the issue of designing language tasks or activities for CMC based on solid theoretical perspectives has been explored by other scholars. For example, Hampel (2006) proposes a framework for the development of tasks in online environments that can be used for language teaching and learning. The foundations of her proposal are Second Language Acquisition (SLA) principles, sociocultural and constructivist theories, and concepts taken from research on multimodality and new literacies. She argues that the internet presents learners with information in different modes and requires them to engage in productive tasks, but although those modes approach to those in face-to-face classrooms, the computer medium, because of its characteristics, is different from the resources employed in traditional settings and this must be taken into consideration when designing tasks.

In practical terms, according to Hampel's (2006) model, when designing activities to teach languages online, it is necessary to take into account several points. First, the approach, which refers to theories about the nature of online (language) learning. Second, the online medium, its possibilities and constraints. Third, the design, which refers to the courses where the tasks are embedded in, the type of tasks used as well as their role in the online courses. Finally, the procedures that examine how the tasks are implemented in the virtual classroom, taking into account the resources employed by the teacher, the interaction that takes place, and the strategies used by teachers and learners.

After implementing the task-design approach, which is based on SLA principles, Hampel (2006) found that the designed tasks fostered interaction among students and between students and the tutor. They facilitated negotiation of meaning and promoted active participation and interaction. She found that the lack of body language has an impact on interaction and instructions, turn taking and feedback has been managed differently. However, the text chat facility can be used for questions or comments and thus compensate for the lack of body language. The lack of body language is not problematic in this investigation because the synchronous learning activities are video conferences in which participants can see each other and body language can be easily perceived and it will not have a great effect on interaction. However, interaction is not the main concern in this investigation.

To sum up, these studies show that there exists a link between language teaching using computers and linguistic and communication theories. They also show that language teaching using computers can be as, or more relational than face-to-face settings where interaction is paramount to learning to take place. These studies have warned us about the possible dangers of using internet for language teaching such as the fact that internet technologies have changing meanings and uses for different communities, the amplification of the gap between formal educational experiences and life experiences of learners that have an effect on their educational

settings. These studies suggest that the particularities of the technology and a solid background of second language acquisition principles and theories should be considered to design appropriate activities or tasks for teaching languages using computers. These studies show, as the seminal studies, that language teaching using computers is informed by sociocultural and constructivists perspectives, together with Second Language Acquisition (SLA) principles. They also suggest that teaching languages online and designing tasks or activities for online environments, concepts such as social interaction, comprehensible input, social and collaborative views of learning, multimodality and new literacies theories must operate. Figure 4 summarizes the theories and perspectives that inform online language teaching.

Sociocultural perspectives
SLA principles
Multimodality
New literacies

Interaction
Comprehensible input
Tasks and interaction-driven approach

CMC

Constructivist approaches
Social and collaborative views of learning
Linguistic and communication theories

Process-oriented approach
Multimodality theories
New literacies theories
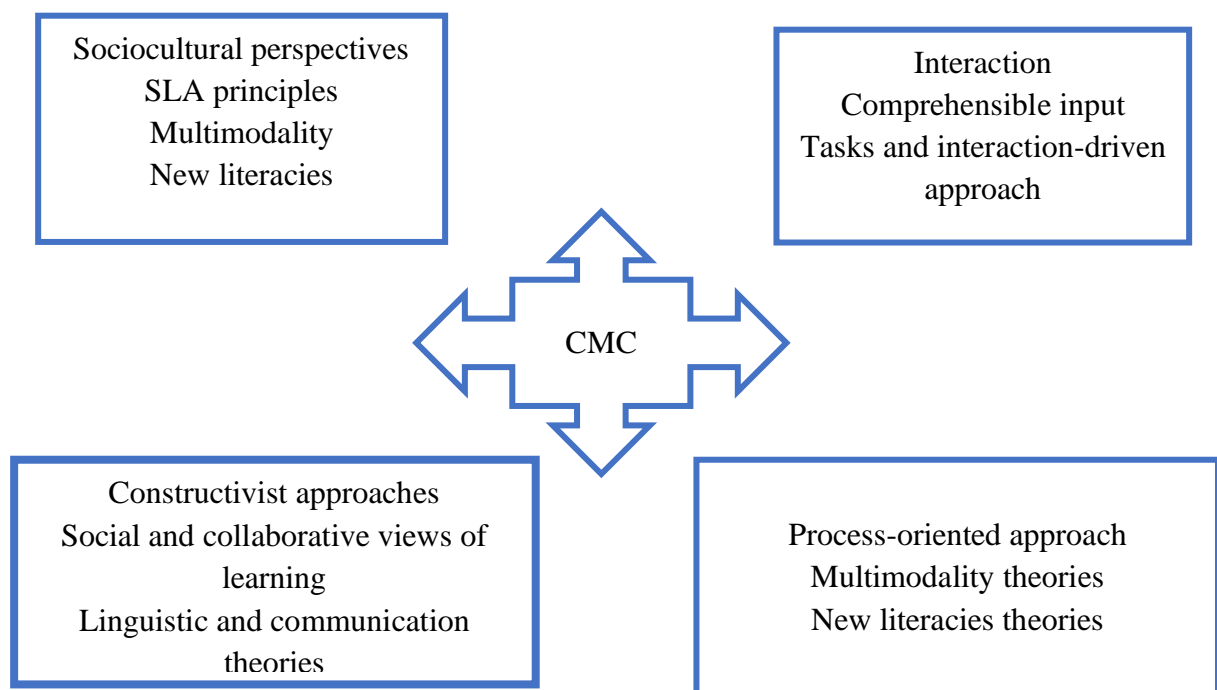
Figure 4. Theoretical perspectives and associated concepts when teaching language online.

2.5 Studies on the use of CMC technologies and discussion of their findings

An example of the use of CMC tools in language teaching where sociocultural perspectives and SLA principles operate is telecollaboration. Dooly (2017) claims that that the

use of internet to connect language learners has been named differently. For example, virtual connections, teletandem, globally networked learning, online interaction and exchange and telecollaboration. They all have in common the use of the internet for language learning and they can include synchronous and/or asynchronous modes of communication. Telecollaboration is considered a major contribution of CMC to the field of language teaching (Thorne, 2008) and one of the main pillars of the intercultural turn in foreign language education (O'Dowd, 2018). More precisely, telecollaboration refers to the process of communicating and working together with other people or groups from different locations through online or digital communication tools with the objective of co-producing a desired work output (Dooly, 2017). It is also referred to as the application of online communication tools to bring together classes of language learners in geographically distant locations to develop their foreign language skills and intercultural competence through collaborative tasks and projects (O'Dowd, 2018).

Dooly (2017) claims that there are four main reasons for the increase interest in practicing telecollaboration as she analyzes the publication of articles about telecollaboration from 1995 to 2014: (1) the proliferation of easily accessible communication technologies, (2) a growing recognition of the importance of intercultural competence and the way in which online exchanges and technologies can support the development of the intercultural competence, (3) the acceptance of the paradigm of language learning as a sociocultural process and (4) the growing needs from emerging labor markets of combining language competences and technological literacies. She also claims that telecollaborative exchanges have become more complex as they have moved from simple e-mail exchanges to structured online projects and tasks. She argues that CMC-supported interaction is being assimilated into social and cultural turns in pedagogy.

Dooly (2017) explains that telecollaboration is based on socioconstructivist theories because telecollaborative exchanges provide opportunities for the individual to develop abilities

or skills through the collaboration of others (peers and teachers who are more experienced). She goes on explaining that from a socioconstructivist perspective the role of the teacher, in telecollaboration, is to set up an optimal environment where learners can construct knowledge through engagement with artifacts and other participants and she mentions The Zone of Proximal Development (ZPD), which is the gap between what the learner could accomplish alone and what he or she could accomplish in cooperation of others who are more skilled or experienced, as the place where knowledge occurs. She carries on explaining that another theoretical construct behind telecollaboration that can be translated into the use of technology in language teaching is Task-Based Language Teaching (TBLT) and she defines tasks as activities that foster second language acquisitions. She states that in telecollaborative exchanges the most common type of tasks are tasks that focus on interaction, which are consistent with socioconstructivist theories and Communicative Language Teaching (CLT) because they promote fluid, frequent and authentic communication. She argues that tasks in telecollaborative exchanges focus on meaning and experiential strategies. She claims that telecollaboration advances CLT into Communication-Oriented Language Teaching (COLT), which emphasizes the use of language in ways that are relevant to the learners and at the same time they develop communicatively, cognitively and as a global person through collaboration.

Dooly (2017) points out that another paradigm that informs telecollaboration is Project-Based Language Learning (PBLL), which she defines as projects completed collaboratively by students and learners through the use of online tools. However, for her, a more suitable paradigm is Technology-Enhanced Project-Based Language Learning (TEPBLL) because it does not underscore the importance that teachers should give to collaborative project building and it promotes not linear, socially-distributed ways of working, which foments the capacity of thinking together in what has been called participatory power. Another theoretical construct that Dooly (2017) points out is learner autonomy. She claims that telecollaboration, with its

focus on mutual support and reciprocity, is an apt learner ecology to promote learner autonomy. She claims that learner autonomy is key for successful technology-pedagogy, which must support reflection, interaction, experimentation and participation of learners. She claims that some determinants can have an effect on the development of learner autonomy. For example, how much autonomy students begin with, how much teacher control is exerted during language activities and how much autonomy the interaction design promotes. Finally, Dooly (2017) suggests that autonomy not only depends on the tools used for communication, but more importantly on the nature of the tasks themselves.

Another example of the use of CMC is Offir, Lev, & Bezalel (2008) where they analyzed the learning processes in synchronous systems by examining the differences in the achievements of close to 60 students who participated in an "Introduction to Computers" course that was transmitted via the internet. Offir *et al.* (2008) explored the differences between students with high and low levels of thinking using a personality test and a series of class observations. They also tested abstract verbal thinking ability.

Offir *et al.* (2008) argued that synchronous learning is more effective among students with a high cognitive ability than among those with a low cognitive ability. They suggest that students with low cognitive abilities produce poor quality interactions that generate gaps in communication, which may lead to misunderstandings between the teacher and the students, which in the end may result in a decrease in the quality of learning.

They conclude that the transactional distance of learners, which refers to a teaching environment where the separation between the teacher and the learner is significant enough that special teaching–learning strategies and techniques must be used (Moore, 1997), whose approach to learning is more autonomous because they direct their learning, they take responsibility for their learning, and they exhibit self-direction and self-criticism. They conclude that synchronous learning is more effective among students with a high cognitive

ability than among those with a low cognitive ability because the inflexible nature of the teaching and the few and poor-quality interactions increase the transactional distance and the gaps in communication. In addition, they claim that there is a preference for synchronous communication as there exists a need for the physical presence of a teacher, because this presence affords emotional support and encourages interactive intervention to guide and support during the learning process. The findings of Offir *et al.* (2008) suggest that there is a big need to develop online courses that include synchronous types of CMC, to improve the quality of interactions and to expose learners to different types of tasks or learning activities focused on both deep and surface learning processes. These findings are important for this investigation because, as it will be explained later in this thesis, the participants' level of English limits their performance in the synchronous learning activities.

In another study, in a meta-analysis that seeks to present an overview of empirical studies of CMC in Second Language Acquisition (SLA) conducted between 2000 and 2012, to investigate the overall effectiveness of the wide range of CMC interventions or tasks adopted in SLA classrooms and to identify variables that might moderate the effect of CMC on language learning, Lin (2014) analyzed the findings from 59 (quasi) experimental studies that recruited participants who were L2 or foreign language learners. To analyze those studies Lin (2014) used eight variables that are summarized and explained in Table 3.

Table 3. Variables employed to investigate the effectiveness of CMC interventions

Variable	Description and codes
Computer-mediated communication mode	Synchronous or asynchronous
Computer-mediated communication modality	Text or voice
Task type	Opinion exchange, information gap, jigsaw, decision-making or problem solving
Interlocutor type	Peers, native speakers of the target language, instructor/tutor/researcher, others
Research setting	Second language (SL) or foreign language (FL)
Learner educational level	College and above, middle and secondary school, and primary school and below
Learners' L2 proficiency level	Elementary, intermediate, advanced or mixed

Lin's (2014) study showed very interesting results that inform this investigation. First, with respect to the CMC mode, the results showed that writing tasks were carried out either asynchronously or synchronously, while speaking tasks were almost exclusively conducted synchronously. Second, the study confirmed that to develop speaking skills, there was a preference to employ voice-based CMC, whereas, to develop writing skills, her study showed that text-based technologies were more largely used. She claimed that voice-based CMC was able to engage students more in self-repairs and self-corrections than text-based CMC. She also stated that voice-based CMC gave the students opportunities to monitor their interactions, students were able to correct their inaccuracies, and they could produce comprehensible output. Third, Lin's study found that opinion-exchange tasks were the most favored types of tasks because they engaged the students in meaningful interactions. Fourth, with respect to interlocutor type, Lin (2014) found that having peers as interlocutors was more beneficial than having native speakers. Finally, Lin (2014) found that the studies conducted in second language contexts generated a negative effect on SLA, while those in foreign language contexts a moderate positive effect. Lin's explanation of this finding is that learners in FL contexts are

more enthusiastic about making use of the opportunities offered by the CMC environment than those in SL context, in which such opportunities are available to them beyond the classroom.

The results from this study show the need to evaluate the effects of CMC, for example, how the CMC tools are used, the skills they intend to facilitate, and the tasks that accompany their implementation (Rodriguez, Nussbaum & Dombrovskia, 2012, as cited by Lin, 2014, p. 136). These results are useful to inform the present investigations because it seeks to explore the development of speaking skills, specifically oral language accuracy and the provision of correction strategies and the use of repair moves in an online course that has voice-based synchronous learning activities that mostly have opinion-exchange tasks.

2.6 The use of CMC to teach online: synchronous tools

To have a better understanding of the use of synchronous tools or activities to teach languages online, this section explores some studies that use synchronous tools to develop different language aspects.

Austin, Hampel, & Kukulska-Hulme (2017) explore how voice or the ways in which language and other semiotic means are used for communication, is expressed in a telecollaborative project using Skype. In their investigation, they connected two groups of primary age English language learners across two countries. The participants in their investigation were two groups of twelve 6 and 7-year-old children from different schools who have different L1 (Urdu and Portuguese). The learners met every week to talk on Skype during lunchtime. The objective of the sessions was to make meaning rather than practicing particular language forms as their language skills were varied. They conclude that by expanding their view of voice beyond linguistic performance by including gestures, intonation, eye gaze or material objects, teachers can promote the development of activities which support children's communication and develop their spoken language abilities. They also conclude that when attempting to use a synchronous tool such as videoconferencing to support language learning,

educators need to acknowledge that the emphasis on language skills underlying tasks focused on form are not enough for children to voice their ideas through sustained communication. This investigation also concluded that synchronous communication provided children with rich opportunities to practice their communication skills.

Another example of the use of a synchronous tool for language teaching comes from Satar & Wigham (2017) in a study that focuses on instruction-giving practices. This investigation takes place in a telecollaborative exchange focusing on French as a foreign language. Satar & Wigham (2017) investigated trainee teachers instructions for a role-play task during web conferencing-supported language teaching sessions. This study draws data from interactions in a telecollaboration project that brought together 18 undergraduate business students in their third semester of learning French. The project lasted six weeks and the participants met for weekly 40-minute sessions. The researchers conclude that teachers need to be aware of the multimodal elements that are vital instruction-giving sequences. Teacher must be prepared to effectively use online multimodal environments and they must be equipped with the knowledge and skills to deal with technical difficulties that might occur during instructions. These difficulties range from directing learners' attention to the resources needed to task accomplishment to explaining how the task will be accomplished using online resources. Satar & Wigham's (2017) study suggests that future research should be directed to the needs of online context and explore differences in instruction-giving practices in online and face-to-face classrooms. They claim that there is a need to develop further guidance to support online language teachers' pedagogical practices.

This section provided examples of how to use synchronous tools as learning and teaching activities to develop different skills. They show that these tools have positive effects on learners and learning, which upholds the initial idea of the present study. This section highlights the need to train teachers to use the tools to have more effective learning processes.

2.7 Error analysis

Errors are important for this investigation because their identification is the first step to analyze the development of language accuracy and they are strongly liked with the correction strategies that teachers employ and how learners react to those corrections. Therefore, an explanation of their origins, how they have been analyzed and identified is fundamental to understand how language accuracy develops and how teachers and students deal with errors and error correction in synchronous activities. Errors have been extensively studied in language teaching and they help understand processes of learning languages (Wood, 2017) and they have helped understand the sources of errors and how they should be corrected (Lyster & Ranta, 1997; Mackey, In Park, & Tagarelli, 2016).

In two seminal studies that paved the way to answer the questions above and that influenced many recent studies (see Kartchava & Ammar, 2014; Z. Li & Hegelheimer, 2013; Lixin, 2015; Wood, 2017), Corder (1967) and Selinker (1972), suggest that error production is beneficial for language teaching because identifying leaners' errors not only helps understand how much learners learn, but also how learners discover the rules of the target language. They claim that errors help identify how learners develop their interlanguage, which is the transitional mental representation of the target linguistic system. For Corder and Selinker, an error is the result of a transitory competency in L2 and a mistake is related to physical conditions such as fatigue or psychological conditions such as strong emotions. They identified three types of errors: pre-systematic errors in which the learner does not know the rule in L2, systematic errors where the learner discovers the L2 rule, but he does not apply it properly and post –systematic errors where the learner knows the rule, but for lack of attention or memory, he does not use it.

In an early attempt to distinguish the effects of focus on form in language courses that have a communicative and a sociocultural perspective and to establish a manner to analyze errors, Lightbown & Spada (1990) in a study that sought to examine the relationship between

classroom instruction and interaction and the learners' developing second language abilities, found that focus on certain forms while interacting led to improve the acquisition of certain grammatical features. In their investigation and after analyzing more than a 1000 students and approximately 320 hours of classroom observation, they found that instruction was communicative in nature and it focused on meaning-based activities, it provided opportunities for the negotiation of meaning in group work, together with rich and comprehensible input. They also found that errors were viewed as a necessary part of the developmental process and error correction was relatively rare. From their investigation, Lightbow & Spada's conclusions started to outline the notion of focus on form in communicative settings as they concluded that teachers seemed to have a particular set of structural features on which they placed more emphasis and for which they had greater expectations for correct use. They carried on explaining that such focus seemed to be effective in some cases and less in others. They carried on developing the idea of focus on form by stating that teachers rarely presented grammar lessons in the lessons that they observed. Instead, they tended to react to errors as they occurred. In their study, they also started to develop the positive effects of focus on form in communicative settings as they claimed that some components of the language may not only be amenable to instructional intervention, but may depend on it for development and improvement. Their main conclusion shows that their investigation paved the path for future studies on the benefits of focus of form in communicative settings as it is the case of the present investigation. They concluded that form-based instruction within a communicative context contributes to higher levels of linguistic knowledge and performance. They claimed that accuracy, fluency, and overall communicative skills are probably best developed through instruction that is primarily meaning based, but in which guidance is provided through timely form-focus activities and correction in context.

Similarly, in (1991), Michael Long proposed a focus on form approach to analyze errors in communicative settings trying to reconcile the tension between the desirability of communicative use of the language and felt need for a linguistic focus in language learning. He suggests that the focus on form approach in communicative settings have a series of beneficial effects. First, it speeds up the rate of learning. Second, it affects acquisition processes that are beneficial to long term accuracy. And third, it appears to raise the ultimate level of attainment because it is possible to draw learners' attention to inadmissible construction or language features that differ drastically from the learners' L1 and the target language. He explains that in a focus on form syllabus students' attention to linguistic elements takes place as they arise in the lessons whose overriding focus is on meaning or communication. In the focus on form approach, Long distinguishes between errors that are systematic, pervasive or remediable and he outlines that once the students makes an error, the linguistic feature is brought to learners' attention in any way appropriate to the students' age, proficiency level, etc. (not specifying a strategy), before the class returns to the pedagogic task they were working on (not mentioning the reaction from the student).

Later, research has identified two main sources of errors: L1 interference errors and developmental errors. L1 interference errors appear when the students' L1 and the variety of English that they are learning come into contact with each other, there are confusions, which generate errors in the learners' use of English. Developmental errors appear when learners start to overgeneralize language and use language features inappropriately. For the present investigation, errors are not harmful for language learning because when learners produce errors they are demonstrating part of the natural process of language learning. They are an indication that learning is taking place (Harmer, 2007). As consequence, error analysis appears as a method used to document the errors that appear when learning a language, it helps determine if errors are systematic and if possible explain what causes them.

As a result of the above considerations, error analysis plays an important role for this study because it helps explain how language accuracy evolves across the synchronous learning activities, what type of errors learners commit, and how the teacher and the learners deal with error production and error correction in those types of environments.

2.7.1 Definition of errors

As one of the purposes of this investigation has to do with identifying errors that are subsequently operationalized to find the most frequent ones, defining errors becomes essential to reach this objective. Literature on second and foreign language teaching has highlighted several definitions of errors. For example, Harmer (2007) defines an error as a form or structure that is deviant from the standard target language and needs correction. Error analysis has been a concern for language teaching for a long time and a seminal study in this area is the study of Lyster & Ranta (1997), where error production, corrective feedback and learner uptake were explored. They analyzed 18.3 hours of interaction using a model that comprised an error treatment sequence (error + corrective move (feedback) + responses to feedback) that will be explained later in this thesis. Despite being carried out in a face-to-face setting, this study paved the way to understand issues such as the appropriateness of correcting errors, the appropriate moment to correct them, the type of errors that teachers should correct, how errors should be corrected and who should correct errors. Several studies have tried to answer these questions, demonstrating that research has approached errors differently. This investigation seeks to answer these questions by identifying the errors that learners produce in synchronous learning activities with two purposes in mind. On the one hand to identify the most frequent errors and on the second hand to help identify the corrective moves that are part of the error correction sequences which are indicators of the development of language accuracy in synchronous learning activities.

2.7.2 Error classification

Authors have classified errors differently. For example, Lyster (2001) and Lyster & Ranta (1997) identified the type of errors that students made in French immersion classrooms. They classified errors as grammatical, lexical, phonological, and unsolicited uses of L1. Vinagre & Munoz (2011) classified errors using categories that they modified from Fernández (1997), in a study with 17 post-secondary learners of Spanish and German. They classified the errors as lexical errors, grammatical errors, discourse errors, and spelling errors. MacDonald *et al.* (2013) used a categorization based on Dagneaux, Denness, & Granger (1998) in a study that focused on the differences in the amount and types of errors found in synchronous and asynchronous modes of communication. They employed the Milc Corpus, which is a multilingual learner corpus of texts written by language learners from different language backgrounds. They classified the errors under linguistic categories (morphology, syntax, etc.) and surface structure taxonomy (omission, addition, etc.). Table 4 illustrates the different classification of errors employed in the three studies.

Table 4. Different taxonomies of errors

Lyster (2001 and Lyster & Ranta (1997)	Fernandez (1997) modified by Vinagre and Muñoz (2011)	Dagneaux *et al.* (1998) as cited by (MacDonald *et al.* (2013)
Grammatical errors	**Lexical errors**	**Form**
Errors in the use of determiners, prepositions and pronouns	**Form**	Morphology
	Use of similar signifier	Spelling
Errors in grammatical gender	Formation of a non-existing form	Punctuation wrong
Errors in tense, verb morphology, auxiliaries and subject/verb agreement	Lexical items which result from L1 interference	Punctuation missing
	Gender	**Grammatical**
	Number	Articles
Errors in pluralization, negation, question formation, relativization and word order.	**Signified**	Adjectives – comparative/superlative
	Lexemes with common semes not interchangeable in the context	Adjectives – number
Lexical errors		Adjectives – order
		Adverbs – order
Inaccurate, imprecise, or inappropriate choices of lexical items such as nouns,	Changes in words derived from the same root or stem	Nouns – case
		Nouns – number
	Inappropriate register	Pronouns
	Ser-Estar (to be)	Verbs – auxiliaries
		Verbs – morphology

verbs, adverbs, and adjectives

Phonological errors

Mispronunciations resulting from particularities of the French sound system

Absence of obligatory elison

Absence of obligatory liason

Pronunciation of silent letters

Addition or omission of elements

Unsolicited uses of L1

Instances where students used English where French was more appropriate and expected

Multiple

Students' utterances containing more than one type of error

Periphrasis

others

Grammatical errors

Paradigm

Gender (formation)

Number (formation)

Verbs

Others (person, determiners)

Concordance

Gender

Number

Person

Case

Use of lexical categories

Article

Use/omission

Selection el/un;la/una; der/ein; die/eine

Other determiners (selection): este instead of ese or aquel

Pronouns

Full pronominal function/ omission of "man" in an impersonal structure

Grammaticalized or lexicalized "se"/omission of the pronoun in the reflexive verb

Wrong selection of pronoun

Verbs

Past tense

Other forms

Verb omission

Preposition

Incorrect use/omission

Idiomatic values

Sentence structure

Word order

Omission of elements (not included in other sections)

Functional change

Negative sentences

Sentence relations

Coordination

Omission of conjunction

Polysindeton (repetition of conjunction)

Wrong conjunction

Verbs – number

Verbs – nonfinite/finite

Verbs – tense

Verbs – voice

Word class

Lexis

Conjugation – coordinating

Connectors – logical – complex

Connector – logical – simple

Conjunction – subordinating

Lexical

Phrase

Single

Single – false friends

Register

Style

Style – incomplete

Style – unclear

Word missing

Word order

Word redundant

Lexico-grammar

Adjective – complementation

Adjective – dependent preposition

Conjunction – complementation

Noun – complementation

Noun – dependent – preposition

Noun – countable/uncountable

Preposition – complementation

Verb – complementation

Verb – dependent preposition

	Subordination	
	Adjectival	
	Omission of conjunction or surplus of same	
	Selection of conjunction	
	Verb concordance	
	Nominal	
	Omission of conjunction or surplus of same	
	Selection of conjunction	
	Verb concordance	
	Adverbial	
	Omission of conjunction or surplus of same	
	Selection of conjunction	
	Verb concordance	
	Discourse errors	
	Global consistency	
	Co-reference: deixes and anaphora	
	Tense and aspect	
	Linkers	
	Punctuation	
	Spelling errors	
	Punctuation (this includes those errors that result from not knowing punctuation rules; it excludes punctuation whose purpose is to show separation of ideas, which is included in the discourse section)	
	Accents	
	Separating/linking words	
	Change in letter order	
	Phoneme confusion (e/i, o/u, b/p, a/ä, s/z, ü/u)	
	Omission of letters or surplus of same	
	Confusion of grapheme for the same phoneme (b-v, c-z, qu-c)	
	Capitals	

2.7.3 Classification of errors employed in this study

After having explored three different taxonomies of errors, the present study adopts Lyster & Ranta's (1997) classification of errors for different reasons. First, despite being originally used to explore errors in French, their categorization of errors is more comprehensive because it has fewer categories which facilitates the identification of errors in the present corpus. Second their study is the first study that includes the error treatment sequence that starts with an error, it also includes the teacher's response to the error and the learners' immediate reaction to the teachers' correction. The error treatment sequence is employed in this investigation to identify the errors, the correction strategies and the repair moves in the present corpus. This is further explained in the methodology section of this thesis.

The present investigation uses the following classification of errors: grammatical, lexical, and phonetic errors. Grammatical errors are subsequently divided into errors in the use of parts of speech such as articles, pronouns, verbs, prepositions, auxiliaries, also word order errors and omission of words and inappropriate use of affixes. Lexical errors are divided into inappropriate choices of words and unsolicited uses of L1, Spanish in this case. Finally, phonetic errors are integrated by mispronunciations resulting from particularities of the English sound system (vowels or consonants), addition or omission of sounds, absence of obligatory linking, inappropriate uses of stress and intonation and incomprehensible words. Table 5 summarizes the classification of errors used in the present study.

Table 5. Classification of errors used in the present study

Grammatical errors	Lexical errors	Phonetic errors
Errors with inappropriate or inaccurate uses of parts of speech: Articles Pronouns Verbs Prepositions Auxiliaries Word order Inappropriate uses of affixes	Inappropriate word choice Unsolicited uses of L1	Mispronunciation of vowels and consonants Addition or omission of sounds Absence of linking Inappropriate uses of stress and intonation Incomprehensible words

2.7.4 Studies on the analysis of errors in CMC and discussion of their findings

This section of the thesis analyses two studies. One explores the improvement of pronunciation in synchronous voice computer-mediated communication and another study explores the effects of explicitly focus on form in written synchronous computer-mediated communication on grammatical development.

Bueno-Alastuey (2010) explored the improvement of pronunciation in synchronous-voice computer-mediated communication. The participants in Bueno-Alastuey's (2010) study were 42 Spanish undergraduates majoring in agricultural sciences. She divided the participants into three groups: The first group had English as a compulsory subject, the second group was doing a course in oral communication in English, and the third group studied Spanish as an optional subject. She found that phonetic errors represented nearly half of all the errors in both the pre-test and the post-test, except for one of the groups in the study, in which the phonetic errors represented 32.2%. She also found that within the three groups that participated in the study, when compared, the number of phonetic errors decreased, which is an indication of the development of language accuracy as will be explained later. Additionally, she found that some of the phonetic errors perceived as serious did not produce any breakdown in communication. To explain her results, she points to Jenkins' (2002) statement that claims that interaction

between non-native speakers allows learners to become aware of the features of their own pronunciation systems, which are liable to be unintelligible to other L1s, and they endeavor to make adjustments.

In another study, Fiori (2005) explored the role that consciousness raising (CR), which refers to explicit focus on form through specific instruction, plays in grammatical development in synchronous computer-mediated communication (SCMC). Forty-four level-three students of Spanish from a large state university and one instructor, native speaker of Spanish, participated in this investigation. Fiori (2005) divided the students into two groups: (1) Twenty-seven students in the form-and-meaning-focused (FMF) group and 17 students in the meaning-focused (MF) group. She also administered three pre- and post-tests in the second week of classes and in the week before the university's final examination period. The first test involved elicited imitation or sentence repetition, in which the participants had to listen to a series of sentences and attempt to repeat them verbatim within a three-second time frame. The sentences were evaluated by identifying errors related to word substitution or exclusion, incorrect endings and incomprehensible utterances. In the second test, the course instructor assigned oral exam topics, which were related to the course materials. In this test, the students were evaluated on accent, grammar, vocabulary, fluency, and comprehension. The third test had a grammatical preference component, in which students had to review 55 paired sentences in Spanish and choose their preference. Fiori (2005) found that there were greater levels of syntactic maturity in the FMF group and both groups (FMF and MF) had similar levels of lexical density. In other words, the FMF group distinguished between ser/estar, while the MF group used ser as default form. She claims that when learners are instructed to focus on form and meaning, they not only focus on particular language features (ser/estar), but on grammar as a whole. Therefore, she concludes that CR has a positive impact on grammatical development in synchronous computer-mediated communication. As consequence, it cannot be concluded that the absence

of CR hinders grammatical development. However, learners produce less language and the language they produce is less accurate and less syntactically complex. Furthermore, learners rely on *ser* as the default to be form (in Spanish verb to be is *ser/estar*). She also found that CR had a noteworthy impact on the instructor and the participants because the teacher did not adjust her interaction with the students according to group focus. Rather, she adopted feedback strategies and applied them equally to both groups. She concludes that CR served as a tool that facilitated grammatical development in the synchronous computer-mediated forum.

Together, the previously cited studies provide important insights into the development of language features in computer-mediated environments. They indicate the usefulness of measuring the production of errors to evidence the development of language accuracy. They suggest that oral synchronous CMC activities foster the development of phonetic accuracy, while written synchronous CMC activities promote the development grammatical accuracy. Additionally, they suggest that mixing CMC environments and making learners aware of the features of the language has positive impacts on the development of accuracy. Additionally, errors, together with error analysis and error classification are crucial constructs for the present investigation because once errors are identified and classified in the synchronous learning activities, they help validate or refute the initial belief around which this investigation revolves as they are evidence of the development of oral language accuracy.

2.8 Error treatment

As this investigation includes the exploration of the ways the teacher corrects the errors produced in synchronous learning activities, it is necessary to analyze concepts such as corrective feedback, correction strategies and repair moves. The first part of the following section refers to those concepts. The second part addresses the categorization of correction strategies and the repair moves employed in this study. Finally, the third part will focus on

studies that explore the relationship between correction strategies and repair moves in online settings.

According to Sauro (2009), corrective feedback is based on the noticing hypothesis proposed by Schmidt (1990), which claims that for learning to occur, second language learners must attend to and notice details and differences between the target language and their interlanguage or the learners' language system, and its representation in their production output. Sauro carries on explaining that by juxtaposing learning output with input, corrective feedback can assist the acquisition of certain difficult features of the language by increasing the likelihood that they will be noticed. Sauro argues that besides facilitating the noticing of difficult language features, certain types of corrective feedback may also promote L2 processing. Schmidt's noticing hypothesis also states that frequency of language form in the input does not result in acquisition if it is not noticed by the learner and corrective feedback of the mistake does not contribute to his learning if they are not noticed by the learner (Ünlü, 2015). The present investigation views corrective feedback from an interactionist perspective on SLA specifically, the role of interactional modifications in promoting attention to and noticing of linguistic forms. This noticing is an essential first step in the eventual integration of target-like forms into the learner's language system (Smith, 2010). This investigation also views corrective feedback from the principles of focus on form in communicative settings outlined by Lightbown & Spada (1990); Long (1991).

There have been three lines of research on the effects corrective feedback on second language processes and outcomes: (1) the noticing of target language forms, (2) learning responses and (3) the learning of L2 forms as evidence of improvement in L2 form and production (Sauro, 2009). The present investigation concentrates on the second line of research, learning response, because it focuses on learners' output in terms of the production of repairs and accuracy in repairing errors (Lyster & Ranta, 1997; Nassaji, 2007).

Research has defined corrective feedback as any indication to the learners that their use of the target language is incorrect (Thouësny, 2010). Corrective feedback includes various responses that learners receive from teachers or peers, which are called correction strategies. Corrective feedback includes strategies that explicitly or implicitly provide the correct form to the learners' inaccurate utterances. Explicit corrective feedback makes errors more noticeable and implicit corrective feedback provides information that helps learners find the correct option to their ill-formed utterances. Li & Hegelheimer (2013) define correction strategies as, 'teacher and peer responses to learner's erroneous second language production'. They have also been identified as reactions used by teachers in response to learners' errors (Jepson, 2005; Nassaji, 2007).

A seminal study in this area and the study that informs the research questions, the research instruments and the analysis of information as it will be explained in the methods section of this thesis, is Lyster and Ranta (1997), which categorizes correction strategies as explicit corrections, recasts, elicitation, metalinguistic clues, and clarification requests. They point out that explicit corrections refer to the explicit provision of the correct form. They explain that by providing the correct form, the teacher indicates that the student's utterance is incorrect. For them, recasts involve the teacher's reformulation of the complete or part of a student's utterance. Sagarra & Abbuhl (2013) take on a definition of recasts from Long (2007), they state that a recast is a reformulation of all or part of a learner's immediately preceding utterance in which one or more non target-like items is/are replaced by the corresponding target language forms and where, throughout the exchange, the focus of the interlocutors is on the meaning and not on the language as an object. Recasts are claimed to be an ideal correction strategy because they provide immediate feedback about incorrect utterances in an unobtrusive manner and they also provide a model of target-like input (Egi, 2010; Lai, Fei, & Roots, 2008). However, learners need training that helps them notice the corrective nature of recasts (Lyster & Ranta,

1997). Lyster & Ranta (1997) adopt this term from the L1 acquisition literature and cite other terms such as 'paraphrase' (Spada & Frohlich, 1995) 'repetition with change,' and 'emphasis' (Chaudron, 1977).

According to Lyster & Ranta (1997), teachers employ clarification requests to indicate to students that an utterance has been misunderstood or that the utterance is inaccurate and that it needs a repetition or a reformulation. Unlike recasts, when utilizing clarification requests, teachers usually employ phrases like "Excuse me?" and "I don't understand," to indicate the message has not been understood or that the students' utterances contain an error. Sarandi (2016) defines clarification requests as, 'a scaffolding to create understanding'.

For Lyster and Ranta (1997) metalinguistic clues are 'comments, information or questions related to the formation of a student's utterance'. Metalinguistic clues do not explicitly provide the correct form. When teachers employ this strategy, they generally indicate that there is an error somewhere. This strategy usually provides grammatical metalanguage that refers to the nature of the error or a word definition in the case of lexical errors. Monteiro (2014) states that metalinguistic feedback is information given about the error committed, without providing the correct form. He also calls these clues prompts, which is a feedback move that induces learners to repair the incorrect forms on their own. Lyster and Ranta (1997) claim that metalinguistic clues provide negative evidence, which is regarded as an explicit form of feedback.

For Sarandi (2016), elicitations refer to a direct reformulation of a student's utterance by asking questions or by pausing, to allow students to complete the teacher's utterance or by asking students to reformulate it. According to Lyster and Ranta (1997), elicitations are 'explicit and output pushing'. They are 'explicit' because the corrective force of feedback is made salient to learners and they are 'output pushing' because learners are required to work out the correct form of their utterance using their own language repertoire.

Repetitions refer to the teacher repeating the students' ill-formed utterances, adjusting the intonation to highlight the error (Jepson, 2005; Lyster & Ranta, 1997; Nassaji, 2007). Table 6 summarizes the correction strategies, their definitions from the study carried out by Lyster and Ranta (1997), and provides examples that broaden the scope of the definitions.

Table 6. Correction strategies, their definitions, and examples

Correction strategy	Definition (Lyster & Ranta, 1997)	Example
Recasts	A recast is what the teacher says with the purpose of helping a student notice his or her mistakes. Teacher implicitly reformulates all or part of the student's utterance. Implicit reformulation of all or part of the learner's utterance	Student: a man holding a box Researcher: right, he is holding a box Student: glasses box Researcher: a box with "GLASSES" written on it. (Lai et al., 2008)
Elicitation	Elicitation is a technique by which the teacher gets the learners to give information rather than giving it to them. Teacher directly elicits a reformulation from students by asking questions. A prompt for the learner to reformulate.	Student: my father work in a factory. Teacher: what does your father do? Student: work in a factory. Teacher: work? Student: sorry works. He works in a factory… and he wake up in the morning. Teacher: what does your father do in the morning? Student: sorry, wakes up. He wakes. (Sarandi, 2016)
Explicit corrections	Teacher supplies the correct form and clearly indicates that what the student had said is incorrect. Explicit provision of the target-like reformulation.	Student: yesterday, I visit my uncle. Teacher: you should say visited. (Sauro, 2009)

Repetitions from the teacher	Repetition of all or part of the utterance containing the error, often accompanied by a change in intonation	Student: Yesterday, we visit my aunt. Teacher: yesterday, we visited… (Sauro, 2009)
Clarification requests	An utterance indicating a problem in comprehension, accuracy or both	Student: Yesterday, we visit my aunt. Teacher: pardon? (Sauro, 2009)
Metalinguistic feedback	Comments, information or questions that may or may not contain metalanguage, but do not include the reformulation related to the ill-formed utterance	Teacher: there's a mistake… (Sauro, 2009)

2.8.1 Studies on corrective feedback in CMC and discussion on their findings

This section of the thesis will explore two studies. The first study is about computer-administered feedback and its effects on the development of language accuracy and the second study focuses on the effectiveness of metalinguistic feedback and recasts on the development of language skills in video conferences. Sagarra & Abbuhl (2013) conducted a study that sought to examine written or oral computer-delivered feedback namely, recasts, utterance rejection, which is a type of explicit feedback and enhanced recasts and working memory. The participants in their study were 218 first-semester Spanish students. They were native speakers of English with no previous exposure to Spanish or any another Romance language outside the course. The target structure of the study was noun-adjective agreement in Spanish because it has low salience, low reliability and redundancy. These characteristics make the noun-adjective agreement less noticeable and ultimately less learnable (p 200). The procedure that they followed was a first experimental session that was conducted in class, which consisted of completing a consent form and attending a vocabulary presentation. Four days later, the participants completed the vocabulary test and the grammar pre-test in class. One week after

these screening activities, the treatment and the first written test were carried out via computer during a 50-minute session in a computer laboratory. The remaining posttests were carried out 1 week (delayed written posttest 1), one month (delayed written posttest 2), and 2 ½ months (interactional posttest) after the treatment. They add that each written posttest lasted 15 minutes. One month later, the participants met with a research assistant in an office for 1 hour to complete the two oral posttests. (p. 201). Sagarra & Abbuhl (2013) found that orally enhanced recasts were more effective than both orally unenhanced recasts, which suggests input enhancement agreement and typographically enhanced recasts, which denotes modality effect according to the posttest results.

They also found that recasts were more effective than utterance rejections in identifying the target structure (noun-adjective agreement in Spanish). This was true regardless of feedback modality, for both written posttest and the interactional posttest. They also found that orally enhanced recasts led to more target-like modified output than either orally unenhanced recasts or typographically enhanced recasts. Finally, they found that recasts led to more target-like modified output than utterance rejection. In particular, written recasts led to more target-like modified output than written utterance rejection (p. 209). They partially confirm their hypothesis about feedback explicitness effects as they thought that the more explicit types of feedback (utterance rejection and enhanced recasts) would be more effective than the less explicit forms of feedback (unenhanced recasts and no feedback). Their results show that the relatively explicit utterance rejection led to greater gains than those observed in the control group. However, they were less effective than both written and oral enhanced recasts; unenhanced written recasts and unenhanced oral recasts. Finally, they found that working memory was positively associated with the performance of the oral recast and the production of target-like modified output.

Their study concludes that orally enhanced recasts are more effective than typographically enhanced recasts and typographically/orally unenhanced recasts. However, they point out that the type of utterance rejection that they employed is not comparable to the utterance rejections that take place in communicative contexts, as computerized treatment activities do not provide opportunities to produce modified output. In their detailed study, Sagarra & Abbuhl (2013) show that computer-mediated feedback can promote the development of L2 linguistic accuracy. The present investigation adds another perspective to the analysis of the use of recasts in web-based environments because it explores them in an online communicative context, where interactions take place naturally and the production of errors is less controllable. However, the present investigation does not focus on a particular language feature. Instead, it explores the production of errors together with the production of correction strategies and repair moves as indication of the development of oral language accuracy.

The second study that deals with corrective feedback in online environments is Monteiro (2014) where she made an analysis of the effectiveness of metalinguistic feedback and recasts on implicit and explicit knowledge. They define implicit knowledge as intuitive and automated, usually acquired through a natural process with conscious effort and explicit knowledge as analyzed knowledge, the one of which leaners are consciously aware, which is often regarded as inconsistent and is acquired through conscious operations either incidentally or through instruction. They explored this in dyadic video-conferencing between the researcher in the USA and the participants in their houses in Brazil. Monteriro (2014) decides to use Skype as the tool to carry out the study because it allows for video conferencing, sharing the interlocutor's screen, fast file transfer, and the sending of instant messages, all during video interaction (p. 60). The participants in the study were 65 Portuguese-speakers learning English who were assigned in three groups: Focus Task (FT) + metalinguistic feedback, FT+ recast and FT only.

The target structure of this study was the irregular simple past tense in English. Monteiro (2014) followed this procedure: On the first day, the participants took a pre-test after which there was the first treatment session. There was an interval of one week before the second treatment session and an immediate posttest. Following this, there was a two-week interval after which the participants took a delayed posttest. Monteiro (2014) found that metalinguistic feedback and recasts with focused tasks are effective at helping learners develop explicit and implicit knowledge over time. A likely explanation is that oral metalinguistic feedback and recasts are equally effective when they are intensive, individualized, and controlled. In general terms, recasts help learners by allowing them to compare the target-like forms and store them in memory. She argues that metalinguistic feedback forces learners to access and retrieve target forms from memory. Her findings suggest that focused tasks are also effective in promoting implicit and explicit knowledge because they help learners develop knowledge of the target structures.

Monteiro's study suggests that during dyadic video-conference interactions, focused tasks, with or without corrective feedback, help learners develop implicit and explicit knowledge of the target language. This study shows that there is not a significant difference between recasts and metalinguistic feedback because dyadic video-conference interactions are similar to laboratory interactions where feedback is controlled and individualized, making the corrective force of recasts as much evident as metalinguistic feedback. Besides the lack of difference between the feedback groups and the focused tasks only group happened because the intensity and length of the treatment session (p. 69). Monteiro's investigation suggests that intensive and individualized focused tasks, with or without feedback help develop implicit and explicit knowledge and metalinguistic feedback and recasts were shown to be equally effective.

Monteiro's (2014) study is useful for the present investigation because it seeks to identify the types of corrective feedback that the teacher uses in synchronous learning activities

and explores their effectiveness in terms of teaching learners explicitly or implicitly how a language structure works. Moreover, the present investigation attempts to identify the correction strategies that the teacher utilizes, recasts and metalinguistic clues are included, but it does not concentrate on a particular correction strategy. In addition, Monteiro's (2014) suggestion for future research fits with the present investigation's purposes as she states that future research in video-conferencing is promising and future studies should explore how technological tools can be used in order to enhance corrective feedback. She states that because of the increasing use of technology in language teaching and learning, it is indispensable to understand how language is acquired with the mediation of computers. Besides, the present investigation seeks to identify similar corrective feedback moves (metalinguistic feedback and recasts) and the type of reactions that they generate. Also, the present investigation seeks to explore the effects that corrective feedback has on the development of language accuracy.

The evidence presented in these two studies explores the effectiveness of written and oral computer-delivered feedback, different types of feedback such as recasts, utterance rejection and metalinguistic feedback to develop different language aspects such as implicit and explicit knowledge in different environments such as video-conferencing. These studies are useful for the present investigation because they show that correction strategies (recasts and metalinguistic clues) aided by the use of technology promote the development of language aspects as the present investigation seeks to identify.

2.9 Repair moves

Repair moves or learning uptake is also a relevant concept for this study because they are an indication of the development of language accuracy. This section provides an exploration of the notion of learner uptake, a definition of repair moves and an exploration of the classification of repair moves that this study employs. This section also provides some examples

of repair moves from different studies. Finally, this section covers some studies that use and identify repair moves in different settings.

The concept of repair move originates in the idea of learner uptake. In fact, some researchers use the term repair moves and learner uptake interchangeably (see Lyster, Saito, & Sato, 2013; Panova & Lyster, 2002; Ribeiro, 2018). However, for Shamsudin & Karim (2013), the concept of uptake was originally understood as the frequency count of the students' correct responses to each type of teachers' correction or reaction to an error. For them, learner uptake is also defined as a student's utterance that immediately follows the teacher feedback and that constitutes a reaction in some way to the teacher's intention to draw attention to the some aspect of the student's initial utterance. Additionally, they link the notion of uptake to reactive and preemptive focus on form, which is a student response that occurs where learners have demonstrated a gap in their knowledge by making an error or asking a question.

They carry on explaining that it is the teacher who replies to that gap by supplying explicit or implicit information on a linguistic form and uptake is the student's attempt to incorporate the information into his own production. Learner uptake can be categorized in successful or unsuccessful uptake. In sum, for this investigation, learner uptake is a response by the student to the information that usually the teacher provides on an incorrect linguistic form generated by the student (Shamsudin & Karim, 2013).

2.91 Definition of repair moves

Repair moves are a way to materialize learner uptake. A number of studies have defined repair moves as students' reaction to teachers' correction that are generated implicitly or explicitly to the various negotiation types of corrective feedback (e.g., recasts, elicitation, clarification requests) that occur in the course of interaction to deal with communication problems (Nassaji, 2007). Repair moves are also defined as practices that deal with problems such as, trouble in speaking, hearing, and understanding the talk in conversation (Lyster &

Ranta, 1997). For the purpose of this investigation, the presence of repair moves is an indication of the development of language accuracy and a sign of the development of language skills. In other words, the presence of repair moves is an indication of learner uptake.

2.9.2 Classification of repair moves employed in this study

Many studies have explored repair moves, from different perspectives and in different settings. For example, the relationship between recast and leaner uptake/repair (Asari, 2012; Sheen, 2006), the effectiveness of oral metalinguistic feedback and recasts (Monteiro, 2014). The effectiveness in this case was evidenced through the production of repair moves and the production of the modified target structure, the patters of repair moves in synchronous text chatroom in comparison with voice chats (Jepson, 2005), finally the use of repair moves when teaching children and teaching adults (Cho & Larke, 2010; Suzuki, 2005).

All these studies employed the error treatment sequence proposed by Lyster & Ranta (1997) and they used Lyster & Ranta's (1997) categorization of repair moves, which is the categorization employed in the present investigation: Successful and non-successful repair moves. According to Lyster & Ranta (1997), successful repair moves are the ones that lead to correction and they are repetitions of teacher's correction, incorporation of teacher's correction, self-repairs, and peer repairs. Successful repair moves provide evidence of noticing of errors (Sheen, 2006) and are employed in the present investigation as evidence of the development of oral language accuracy. Non-successful repair moves are the ones that do not lead to correction, but rather they result in the student providing a yes/no answer or in students hesitating and making the same or a different error. Non-successful repair moves are also evident when the students respond to the teacher's feedback, but without including any reference to the error or when the students react to the teacher's feedback, but the reaction only includes part of the initial error. Tables 7 and 8 show the different types of repair moves, what they refer to, and some examples.

Table 7. Successful repair moves

Successful repair moves	What they refer to (Lyster & Ranta, 1997)	Example
Repetitions	A student's repetition to the teacher's feedback	Student: *"He drop his wallet yesterday"* Teacher: *"Dropped"* Student: *"Dropped"* (Monteiro, 2014)
Incorporations	A student's repetition of the correct form provided by the teacher	Student: *"They hired me. But when I meet someone in…"* Teacher: *"met"* Student: *"When I met someone, there's a foreigner in there"* (Sheen, 2006)
Self-repairs	Self-corrections	Student: *"This has beeb, I mean been great."* (Jepson, 2005)
Peer repairs	Peer corrections provided by another student or classmate	Student 1: *"This city beautiful"* Student 2: *"What do you mean by that?"* Student 1: *"This city is beautiful"* (Jepson, 2005)

Table 8. Non-successful repair moves

Non-successful repair moves	What they refer to (Lyster and Ranta, 1997)	Example
Yes/no answer	A simple yes or no answer to the teacher's feedback	Student: *"I stand in the first row"* Teacher: *"You stood in the first row?"* Student: *"Yes"* (Sheen, 2006)

Hesitations	A student's hesitation to the teacher's feedback	Student: *"Do you have time for drinking?"* Teacher: *"Do you have time…"* Student: *Do you have time for drinking tonight?"* (Asari, 2012)
Same error	A repetition of the same error	Student: *"Well, Monday, lemme think. Monday, Wednesday, an' Friday I'm home by one ten"* Teacher: *"One ten?"* Student: *"Two o'clock. My class ends one ten"* (Cho & Larke, 2010)
Different error	A response to the teacher's feedback, but including a different error	Teacher: *"How did you meet your partner?* Student: *"On a party, on a party"* Teacher: *"At a party, at a party"* Student: *"I meet my partner at a party"* (Sheen, 2006)
Off target	A response to the teacher's feedback, but without including any further error	Teacher: *"For you, what are the three foods you hate?"* Student: *"I ate every food"* Teacher: *"You can eat any food?"* Student: *"I hate natto"* (Asari, 2012)
Partial repair	A response to the teacher's feedback that only includes part of the initial error	Student: *"When I don't understand what garden [kuden] is in Japan"* Teacher: *"[kuden]?"*

		Student: *"[guden]?"* (Suzuki, 2005)

2.9.3 Studies on repair moves in CMC and discussion on their findings

Thus far, several studies have highlighted the factors associated with the utilization of repair moves or learner uptake and they have shown a relationship between correction strategies and repair moves. This section explores three studies where repair moves are explored together with their relationship with corrective feedback.

Akiyama (2017) carried out a study that investigated corrected feedback beliefs and practices of Japanese and American college students who engaged in a 14-week virtual exchange or a collaborative video-based project. To achieve that objective, she employed a mixed-method, longitudinal design. In her investigation, she collected data from 24 participants' survey data, six pairs´ interaction data in Japanese, and data from five participants´ interview. The participants in Akiyama´s study were 12 learners of Japanese in the U.S. who were native or near native speakers of English and 12 learners of English in Japan whose first language was Japanese. The participants in the study took a two-hour corrective feedback training course where they practice six correction methods based on Lyster and Ranta (1997) corrective feedback taxonomy. At the end of the training sessions, the participants were skillful using the taxonomy. The participants were strongly encouraged to provide corrective feedback and were constantly reminded to do so. Since Akiyama's study only looked at interaction data in Japanese, participants in the US are the feedback receivers and participants in Japan are the feedback providers. The video conference session took place on a designated weekend and for each 1 hour-long session, the participants spent 30 minutes speaking in Japanese and the other 30 minutes speaking in English. Akiyama's results showed that the majority of participants wanted to receive corrective feedback overall, and this preference for error correction remained

the same through the period of the study. The study also suggested that the participants preferred to receive recasts over more explicit types of corrective feedback.

Akiyama´s study concluded that the corrective feedback providers (participants in Japan) only provided three types of corrective feedback: recasts, explicit corrections and clarification requests. There was often a mismatch between learners´ preferred method of receiving feedback and their partners´ preferred method of providing corrective feedback. Learners do not usually receive their favorite type of feedback. Many errors were not corrected by the native-speaking partners and the rate of uptake was higher when corrective feedback was provided in the way learners prefer to receive it.

In another study, Ene & Upton (2014) investigated the types of electronic written feedback learners receive on writings that were submitted and returned electronically and the relationship between feedback and uptake. The participants in their study were 12 non-native English speakers and they carried out an observational, correlational cohort study that observed a group of participants, without manipulating the variables over a period of time in multiple waves of data collection. They analyzed the written production of students in three different drafts before the final submission, together with the comments and corrections that the teachers included electronically. They used a coding sheet that described the types of written electronic feedback based on the topic focus of the teacher´s comment, they used a second coding sheet to categorize student uptake as any revisions made in response to feedback and it was considered a measure of feedback effectiveness. In their study, Ene & Upton (2014) found that the amount of teacher e-feedback was predominately corrective/negative, it mostly focused on content, followed by organization and grammar. They also found that the overall rate of successful uptake was high, with the highest rate being in response to teacher e-feedback focused on grammar, more successful uptake occurred in the first draft, especially following direct e-feedback and e-feedback on content.

Finally, Bueno-Alastuey (2013) carried out a study that sought to determine whether different dyad composition affected the number and types of Language Related Episodes (LRE), the kind of LRE, signals and the amount of student uptake produced in a two-way exchange information task carried out through synchronous voice-based computer-mediated communication. The participants in her study were 42 dyads: 14 dyads of non-native speakers who shared the same L1 (Spanish-Spanish) or NNSs Same L1, 14 dyads of non-native speakers with different L1 (Spanish-Turkish) or NNSs Different L1, and 14 dyads of non-native speakers and native speakers (Spanish-American) or NNS-NS. The participants in her study had to carry out a two-way information exchange task using Skype. The conversations were analyzed for trigger LREs (global, lexical, morphosyntactic and phonetic), signals of LREs (negotiation and negative feedback), type of negative feedback (recasts, explicit corrections and elicitations) and type of modified output or learner uptake (lexical, morphosyntactic and phonetic). For her study, LREs were defined as parts of a conversation where learners focus on form, talk about language or implicitly or explicitly question their language. Bueno-Alastuey found that LREs were more abundant in NNS-NNS Diff. L1 than in the other dyads, phonetic LREs were the most abundant in all groups, followed by lexical and morphosyntactic LREs. She also found that there were more instances of negotiation than negative feedback in all dyads, lexical and phonetic triggers caused more negotiation and twice as many negative feedback episodes. Regarding corrective feedback, she found that explicit corrections were the most common type of feedback, followed by recasts and elicitations. Finally, regarding student uptake, she found that about a third of all LREs resulted in learner uptake and the highest proportion of uptake occurred in phonetic LREs, followed by morphosyntactic and lexical LREs. Although they do not necessarily contain feedback.

In summary, the studies cited above show that recasts, explicit corrections, clarification requests and elicitations are useful to develop different language aspects such as content,

grammar and language-related episodes in both oral and written usage of the language. Additionally, these studies show that there is a strong relationship between the type of correction that teachers provide and the amount and type of uptake that learners produce. The present investigation attempts to identify the error treatment sequences, which include the errors produced, the correction strategies and the types of repair moves that the correction strategies generate. The analysis of the error treatment sequences will help describe the development of oral language accuracy in synchronous learning activities.

2.10 The three main areas of L2 proficiency and performance: Complexity, Accuracy and Fluency (CAF)

Accuracy, together with fluency and complexity are the three main areas of L2 proficiency and those three areas create a research area called CAF or Complexity, Accuracy and Fluency. This section provides a definition of the three areas, followed by an exploration of different perspectives to measure them, focusing on the methods employed to measure the development of accuracy. Finally, recent studies that investigate the development of accuracy and discussion of their findings will be included.

According to Housen & Kuiken (2009) CAF has been used both as performance descriptors for the oral and written assessment of language learners and as indicators of learners' proficiency underlying their performance and for measuring progress in language learning. Housen & Kuiken (2009) outline a brief history of CAF and they state that the origins of this triad lied on research on L2 pedagogy as in 1980s when a distinction between fluent vs accurate L2 usage in L2 classroom contexts emerged. They claim that Bumfit in 1984 was one of the first to use this dichotomy when he distinguished between fluency-oriented activities that foster spontaneous oral L2 production and accuracy-oriented activities that focus on linguistic forms and on the controlled production of grammatically correct linguistic structures. They state that the third element of the CAF tried, complexity, was added in the 1990s following Skehan's

(1989) L2 model that, for the first time, included CAF as the three principal proficiency dimensions.

Many researchers have defined the three elements of CAF. For example, Skehan (2003) defines complexity as the stage of elaboration of the interlanguage system or as the extent to which the language produced in performing a task is elaborate and varied (Housen & Kuiken, 2009). For Pallotti (2009) the term complexity is the most problematic of the CAF triad because it can refer to properties of tasks and language performance (L2 complexity). He claims that when complexity refers to tasks, it can be referred to as "difficulty" or task complexity and it is divided into objective difficulty, which are difficulties inherent to the task and subjective difficulty, which are difficulties that emerge from the encounter of a subject's (in)competencies with a task. Pallotti states that using the term complexity when describing language performance entails multiple meanings because it can be applied to lexical, interactional, propositional and grammatical complexity. According to Housen & Kuiken (2009), L2 complexity can be divided into cognitive complexity and linguistic complexity. Cognitive complexity refers to the relative difficulty with which language features are processed in L2 performance and acquisition. They argue that the cognitive complexity of an L2 feature is variable and it is determined by subjective, learner-dependent factors such as aptitude, memory span, motivation or L1 background and more objective factors such as its input saliency or its inherent linguistic complexity. Housen & Kuiken (2009) explain that linguistic complexity can be understood as a dynamic property of the learner's interlanguage system and it has been interpreted as the size, elaborateness, richness and diversity of the learner's L2 system and as more stable property of the individual linguistic elements that make up the interlanguage system. For Housen & Kuiken (2009), complexity can also be referred to as structural complexity that can be further broken down into the formal and the functional complexity of an L2 feature. In order to clarify the concept, Ellis (2009) takes on a definition from Skehan

and Foster (1999) and defines complexity simply as the capacity to use more advanced language, with the possibility that such language may not be controlled so effectively. This capacity may involve taking risks, using fewer controlled language sub-systems and possibly change and development in the interlanguage system.

Another element of the CAF triad is fluency. Fluency has been defined as the learner's capacity to mobilize an interlanguage system to communicate meaning in real time (Skehan, 2003). Brumfit in 1984 suggested that fluency should be regarded as natural language use, whether or not it results in native-speaker-like language comprehension or production (Hunter, 2012). Fluency has also been defined as the capacity to use language in real time to emphasize meaning (Skehan and Foster, 1999 cited by Ellis, 2009) or as the capacity to produce speech at normal rate without interruption (Skehan, 2009) or as the production of language in real time without undue pausing or hesitation (Ellis and Barkhuizen, 2005 cited by Pallotti, 2009). Pallotti goes on with his definition stating that fluency has several sub-dimension: breakdown fluency (number, length and distribution of pauses in speech), repair fluency (number of false starts and repetitions) and speed fluency (rate and density of delivery). Housen & Kuiken (2009) take on a definition from Lennon (1990) and Ellis (2003) and they claim that fluency is the ability to process the L2 with "native-like rapidity" or the extent to which the language produced when performing a task manifest pausing, hesitation or reformulation. To sum up, the notion of fluency is associated with the production of speech in real time or at a normal rate without pausing or hesitations.

The third element of the CAF triad is accuracy. The definitions explored in this section are very important for the present investigation as they help explain a key concept for this study. Accuracy is concerned with the learner's capacity to seek control over the linguistic elements that they have already learned and to avoid producing erroneous forms (Ahmadian & Tavakoli, 2011). In 2009, Ellis, taking on a definition from Skehan and Foster (1999) defines accuracy as

the ability to avoid errors in performance, possibly reflecting higher levels of control in the language as well as a conservative orientation, that is, avoidance of challenging structures that might provoke error. According to Pallotti (2009) accuracy is perhaps the simplest and most internally coherent construct from the three constructs of the CAF triad (fluency and complexity). He claims that accuracy refers to the degree of conformity to certain language norms. He warns us that accuracy is not a direct indicator of interlanguage development and he takes on a claim from Wolf- Quintero *et al.* when they claim that the purpose of accuracy measures is precisely the comparison with target-like use. Whether that comparison reveals or obscures something about language development is another question. Finally, Housen & Kuiken (2009) simply define accuracy as the ability to produce error-free speech and as the degree of deviancy from a particular norm. However, they claim that although this definition seems to be very straightforward, it raises several concerns whether the specified norm should be prescriptive to standard norms (an ideal native speaker of the target language) or to non-standard or even non-native usages acceptable in some social context or in some communities, which leads us again to the concept of error explored above and presents errors as an elusive construct.

Although many studies explore complexity, fluency, and accuracy together, especially in face-to-face settings, this study focuses on the development of accuracy. Seeking control of structures in oral discourses and using learning activities that are mediated by synchronous tools is an opportunity to expand the understanding of the development of CAF in general and accuracy in particular in an online environment and it is an opportunity to confirm or refute Larsen-Freeman's (2009) claim when she says that the context in which the study is conducted affects the CAF of learner performance.

Besides, to explore how CAF in general and language accuracy in particular develops in synchronous learning activities is a great contribution to the expanding field of online English

teaching because it is an opportunity to explore error types, feedback moves that supply learners with correct responses versus those feedback moves that do not (Lyster et al., 2013, p. 9) and subsequent repair moves. These contributions can help teachers, language practitioners, course designers, and learners to understand the type of errors, the type of corrective feedback and repair moves becomes an asset in the language teaching field in an online environment. Accordingly, this study adopts an educational perspective on the relationship between error type, feedback and uptake, operationalized as an inherent part of online language teaching in which teachers engage to achieve instructional objectives that include the consolidation of the development of CAF in general and accuracy in particular (Lyster et al., 2013).

2.10.1 Measurements of CAF

CAF have been evaluated across various language domains by using several tools that range from holistic and subjective ratings by lay or expert judges, to quantifiable measures (ratios, frequencies, formulas) of general or specific linguistic properties of L2 production in order to obtain more precise and objective accounts of an L2 learner's level of proficiency. Additionally, research has employed range of word types and proportion of subordinate clauses for lexical and syntactic complexity, number and types of errors for accuracy, number of syllables and pauses for fluency (Housen & Kuiken, 2009).

According to Skehan (2003) fluency, complexity, and accuracy can be operationalized using different measures. For example, to measure fluency, researchers have analyzed silences, reformulations, and the number of words or syllables produced per minute. With regard to complexity, researchers have analyzed the number of different words in a text divided by the number of words in the same text. Regarding accuracy, researchers have used different basic units of analysis (the clause, Assessment of Speech units or AS units, and attempts) and have performed calculations on the number of error-free clauses, the number of errors per clause,

and the number of errors per 100 words. For the present investigation, choosing the adequate unit of analysis is important, because if the unit of analysis cannot be reliably identified, the measurements made can be misleading (Foster, Tonkyn, & Wigglesworth, 2000). The present study uses the clause as a basic unit of analysis because it allows the analyst to give credit to the performers and also allows the construction of chunks of speech (Foster, Tonkyn & Wiggleswoth, 2000). In the same vein, the present study describes development of accuracy by calculating the percentage of clauses that contain errors in synchronous learning activities in which students take part. Table 9 explains the aspects and the measures that the cognitive approaches have employed to measure fluency, accuracy, and complexity.

Table 9. Aspects and measures that cognitive approaches have employed to measure fluency, accuracy, and complexity (Skehan, 2003)

Theoretical perspective	Aspect to measure	Measure
Cognitive approaches	Fluency	- Breakdown of fluency (Silence) - Repair of fluency (Reformulations, Replacements, False starts, repetitions) - Speech rate (word or syllables per minute)
	Accuracy	- Error-free clauses - Errors per clause - Errors per 100 words
	Complexity	- The complexity-accuracy-fluency dimension (CAF) - Factor analysis - Pienemann's (1998) developmental stages

2.11 Studies on the development of accuracy and discussion on their findings

This section will provide examples of studies that have measured the development of language accuracy. One of those studies is that of Shintani & Aubrey (2016), which sought to establish the effectiveness of corrective feedback mediated by synchronous and asynchronous

communication tools on grammar accuracy. For the purpose of the present investigation, this section focuses on the effectiveness of corrective feedback in synchronous communication activities. Their study took place at a university in Japan and the participants were 68 intermediate-level students of English. The participants were majoring in sociology, business, economics, and theology. The participants were randomly assigned to one of the following three groups: a group that was treated with synchronous corrective feedback (SCF) with 25 participants, a second group that was treated with asynchronous corrective feedback (ACF) with 21 participants, and a third group called the comparison group, with 22 participants. The type of feedback provided in both the SCF and the ACF condition was focused at direct corrective feedback, as this type of feedback is considered preferable in restructuring learner's knowledge, as they receive correction of the same error.

The target structure of their study was the 'hypothetical conditional', which expresses the hypothetical output of an event that did not actually occur in the past. The procedure that they followed during this study was that one of the researchers prepared three different task sheets for the SCF, ACF and the comparison group, they were shared with the groups and the other researcher by Google Docs. The students logged into their Google accounts and opened their shared documents and the researchers gave individualized feedback as they completed the task. One of the researchers provided feedback to the SCF group and the other to the ACF group. In the asynchronous feedback condition, the students had 20 minutes to finish their task without any interruption. Once they finished, one of the researchers read and corrected any errors on the hypothetical conditional in the uploaded tasks. The researcher highlighted and provided corrections. 10 minutes later, the students received the corrections and they had 5 minutes to revise their texts by correcting the errors indicated in the comment box. In the synchronous feedback condition, one of the researchers provided direct error correction using the comment box function during student writing. When the students made errors, the

researcher, first, highlighted the part of the text containing the error and then provided the correction in the comment box. Students revised their writing as they received feedback and they were allowed to correct their text at any time during the task.

Shintani & Aubrey (2016) found that the group that used asynchronous corrective feedback demonstrated significant improvement in the immediate post-test, but the effects decreased in the production of the target structure (hypothetical conditional) in the delayed post-test. They suggest that while asynchronous corrective feedback proved to be effective in enhancing the accurate use of the target structure, this effectiveness diminished over time. They also found that the results of the synchronous corrective feedback group showed a large improvement from the pre-test, but a decrease in scores from the immediate posttest to the delayed posttest, although accuracy was still higher than in the pre-test. They concluded that using an online synchronous communication tool to provide feedback is beneficial in improving the accurate production of the corrected feature in a new learning activity, although its benefits seem to diminish over time. Unlike Shintani & Aubrey's (2016) investigation, the present research not only attempts to examine the development of grammar accuracy, but also the development of phonetic and lexical accuracy, which broadens the scope of understanding the effects corrective feedback can have while using synchronous learning activities to foster learners' oral skills.

The development of accuracy has been measured by examining the development of oral skills and other skills as well. For example, Volle (2005) analyzed the development of accuracy and proficiency in an online course of Spanish that uses real-time synchronous conversations, which are video conference session between the learners and the instructors. The participants in Volle's (2005) study were 19 first-semester learners at the university level, aged between 18 and 40 years whose native language was English. The course materials and tools in Volle's study were a textbook bundle that consisted of a traditional textbook that included one audio

CD, two interactive CD-ROMs, one DVD program, and a student key code to access an online electronic book. Besides these tools that allowed students to practice the different language skills, the participants in the Spanish course had online oral practice that consisted of creating audio WAV files of lesson readings and drill exercises and those audio files were sent to the teacher/researcher via e-mail, there were seven readings WAV files and 25 drill WAV files per student.

In order to evaluate the students' oral production along the semester and to collect data for her investigation, Volle (2005) collected two types of voice emails: read-aloud passages and grammar-drill completions that were sent to the researchers. To measure the development of accuracy, she made an articulation comparison between reading passages in lesson 1 and lesson 7. She made a score comparison between grammar drills in week 4 and 15. She compared pronunciation, stress, and intonation because it was found that speech output varied according to task type. Volle (2005) also collected data from two internet-mediated oral conversations between the instructor and each student, one in week 8 and another one in week 16. From these conversations, she collected an articulation score that assesses pronunciation, stress and intonation, an accuracy score that is adapted from Weir (1990) Communicative Language Testing, and a proficiency score that is adapted from the ACTFL Proficiency Guidelines. The accuracy score card that Volle (2005) employs does not measure the production of errors as the present investigation does, but instead, her score card has six features: appropriate responses, word order, morphology, adequacy of vocabulary for purpose, grammatical accuracy: correct use of tenses and correct use of the verb *gustar* (like). These features were rated in four levels (from 0 to 3) that go from the total lack of mastering the feature to a complete mastering of the feature. The results from the first conversation were compared with those from the second conversation. The methodology that she employed to assess the development of accuracy is particularly relevant for the present investigation for

several reasons. First, because she employs a card that helps her identify several errors that are identified in the present investigation (word order, morphology, vocabulary, and the correct use of verb tenses). Although the present research goes beyond those errors employing a more comprehensive categorization of errors. Second, she measures the development of accuracy, not exactly before the course starts, but once the course has begun, together with the measure of accuracy once the course has finished as in the present investigation, which provides a picture of the initial level of accuracy and allows the possibility to assess the development of accuracy by comparing the initial and the final measures and gives an idea of the development of language accuracy along time.

In her study, Volle (2005) found that there was no significant difference in articulation in terms of pronunciation, stress, and intonation. In terms of accuracy, she found that there was a significant improvement from the first interview to the second interview. She also evidenced an increasing degree of care in pronunciation, which refers to a rate that goes from not effort at all to pronounce correctly or incomprehensible pronunciation, to native-like pronunciation, in the task involving reading compared to the task that involved drill exercises, as the first one represented time for preparation.

Although Volle's study is very compelling and enlightening, the present study explores the development of accuracy using the percentage of error-free clauses and the percentage of clauses that contain errors as evidence of its development and the perception of the participants about the benefits of synchronous learning activities on the development of accuracy. In other words, unlike Volle's study, the present investigation not only assesses the development of accuracy by exploring pronunciation and intonation, but it also assesses the production of grammatical and lexical inaccuracies and it broadens the scope of understanding by including how the participants perceive the synchronous learning activities affected the development of their language accuracy.

Taken together, these studies show that CMC tools can serve two objectives regarding language accuracy. First, they can serve as language instruction scenarios where different strategies can be employed to foster its development and second, they can be research scenarios where different types of data can be gathered that allow to analyze changes in the participants' interlanguages.

2.1.2 The use of qualitative information to illustrate the analysis of the development of oral skills

The sources of data for the present investigation are three, as it will be explained in the next section: the oral performances in the synchronous learning activities, the participation in in-depth interviews and a focus group and the grades from the assessment activities in the online course that is the research scenario of the present investigation. Collecting data from in-depth interviews and a focus group has two purposes for the present research. On the one hand, it helps corroborate patterns, trends or tendencies that are found using measurements or calculation. On the other hand, the it broadens the understanding of a phenomenon from the participant's point of view. It explores perceptions, feelings, insights, and opinions that help go deeper into the information that is not accessible by operationalizing the number of errors or error-free clauses in oral performances or the number of logs into a website. Edith, Díaz, & Miy (2017) state that the use of qualitative information helps incorporate an interpretative point of view based on the experiences of the participants. Similarly, Clark & Creswell (2015) claim that the use of qualitative information helps obtain different, but complementary data on the same topic, to better understand a research problem.

An example of the use of qualitative information to complement the results from the analysis of operationalizing data is a study by Satar & Özdener (2008) that sought to investigate the use of two synchronous computer-mediated communication tools: text and voice chat. In

their study, 90 high school students participated. Their study had a posttest experimental design consisting of three groups: (1) voice chat with 30 students, (2) text chat with 30 students and a control group with 30 students. Their research scenario was a website designed specifically for their study. In the website, students entered by using a user name and a password, and the text and chat sessions were automatically recorded and stored. They employed a speaking test and a Foreign Language Learning Anxiety Scale developed by Horwitz *et al.* (1991) to identify any changes in the students' learning anxiety levels and on the development of speaking proficiency. But besides employing those instruments, they also used questionnaires to complement the scope of their findings and to obtain the gist of the participants' experiences using the tool (p. 599). Although, their purpose when using questionnaires is to open the scope of their understanding of the use of synchronous tools, they are conscious of the limitation of using them as they can be biased and the responses can be inaccurate. Therefore, they employed different strategies to minimize those effects. For example, they administered the questionnaire immediately after the sessions, the questionnaire items were in the participants' native language and were previously read by the other student who were not participating in the study to make sure they were clear. The participants were not asked to add their names and to make sure that respondents were honest with their answers, the importance of having honest answers was discussed with the participants and the purpose of the questionnaire was emphasized (Satar & Özdener, 2008).

Similar to Satar & Özdener (2008), the present study employs qualitative analysis to open the scope of understanding of the development of learners' language accuracy and the use of corrective feedback, and it uses different strategies to assure accurate information. For example, the names of the participants were never asked, the purpose of the activity (in-depth interview or focus group) was explained and emphasized and the questions were shared with my thesis supervisor for feedback. Satar & Özdener (2008) used two different kinds of

questionnaires: open-ended questionnaires, which were administered after each session to have a record of what the students experienced by eliciting their views immediately after the session. Satar & Özdener (2008) also used a Likert-type questionnaire on a scale of one to three at the end of the study to obtain a general insight into the participants´ experiences.

In Satar & Özdener's (2008) study, the results from the speaking test show that although the speaking proficiency levels of the voice chat group were higher than those of the control group, they were not higher than those of the text chat group. But as this sections deals with qualitative analysis that illustrates quantitative analysis, it will focus on the results of the analysis of the qualitative instruments, namely the foreign language learning anxiety scale and the questionnaire. Regarding anxiety levels, they found that there was not significant difference between the foreign language anxiety levels before and after the study. The results from the analysis of the students´ experiences and perception regarding the two tools showed that more than half of the students think that their participation in the voice chat group in pairs decreased their anxiety and only 20% of the students in the text chat group shared this view. 93% of the participants in the voice chat group found that it was easier to communicate with someone they already knew, and 77% of the participants in the text chat group shared this opinion. 70% of the students in the voice chat group considered that they would have been worried about not understanding the other person if they had been chatting to a foreigner and the percentage for the text chat group was 57%. They concluded that the results of the study emphasize that when guided appropriately language learning tasks, SCMC can be an effective aid to improve speaking skills. Satar & Özdener's (2008) study shows that by analyzing the oral production of the students in the synchronous tools and by analyzing their experiences and opinions about their use, together with an analysis of the levels of anxiety, it is feasible to broaden the scope of conclusions.

Other studies have exclusively used qualitative information to explore the use of CMC tools in language teaching. For example, Romaña Correa (2015) focused on the perceptions and insights of students on the development of oral skills using Skype conference calls, Romaña Correa (2015) used his reflections on a journal, surveys, and focus groups to explore the perceptions of L2 students with a low linguistic level in English, about the use of a synchronous tool to promote the development of speaking skills. He divided his research in three main stages: (1) pre-stage. This stage was devoted to informing the participants and the administrative staff about the main objectives of the research project. (2) while-stage. During this stage the online conference calls were implemented during fifty hours (8 weeks) depending on the participants' time availability. Three or four participants and the teacher/researcher took part in the sessions. The researcher sent the participants a set of question prior to the session, the topic during the sessions were the same as the topics covered during the participants' face-to-face sessions. (3) post-stage. This stage started once the 50 hours of pedagogical intervention were covered with online Skype sessions and two data collection instruments were applied: a survey and a focus group that aimed to collect the participants' insights on the experience of making use of Skype conference calls to promote their speaking skills.

Romaña Correa (2015) found that the participants in his investigation considered that the implementation of a synchronous tool could be used to promote the development of oral skills and as a means to construct their social networks. He found that the synchronous tool could be used to reinforce fluency and language course content. It provided learners with more talking time than in the face-to-face interactions. Interestingly, the findings of Romaña Correa (2015) suggest that synchronous tools could be used in subjects other than language training, for the purpose of doing in-depth conversations on the content, revising and concluding unfinished lessons, and providing feedback. Even though, Romaña Correa's (2015) findings are very compelling, the present investigation goes deeper into analyzing the aspects that he

has not explored fully. For example, the present study concentrates on the perceptions of how synchronous tools help the development of accuracy. Another point by which the present study broadens the scope of understanding of the use of synchronous tools for language teaching is that Romaña Correa's experience is about the use of a synchronous tool as an extension of a classroom course, while the present experience analyzes the development oral skills when using a synchronous tool, which provides complementary evidence of how learners perceive the effects of those tools on the development of language skills. However, his findings are very similar to the findings from the present investigation, which will be explored extensively in other sections of this thesis.

Finally, Edith *et al.* (2017) employed qualitative data to analyze the perceptions of the development of oral skills in an online course of English that had communicative tasks, grammar explanations, exercises for practice, and assignments. There were nine participants in their investigation with a low level of English. They analyzed a semi-structured interview, document analysis (digital registers), participant observations of the learners' use of information and communication technology tools, and their work and interaction on the online platform, together with other quantitative data collection instruments (a survey and a pre- and post-oral test). They found that the participants perceived that their interaction with the teacher was very limited. They also found that there was a low level of involvement in the course with regard to the development of oral skills. They found that oral skills were basically promoted by the teacher although the results of the pretest-post-test showed better results as they show evidence of an increment in the participants' scores in the second posttest given to the learners. Edith *et al*. (2017) concluded that there is a link between the development of oral skills and course design because there should be a connection between the activities in a course and its approach to language teaching and learning. In the same vein, the research scenario of the present investigation is a carefully designed online course, where its components, which will

be explained in detail later in this thesis, aim to develop oral skills. They allow to deeply explore the aspects that were missed out in their investigation, such as, the identification of the types of errors that the students sensed as being more frequent and the identification of the aspects that are perceived to be improving over time.

2.13 Summary

This section explored the main concepts that frame this study, namely different trends in SLA research, computer-mediated communication, error analysis, error treatment, learner uptake, together with repair moves and language accuracy development. This section also explored the concepts of complexity, accuracy and fluency (CAF). At the end of the section, there was a segment that explained how different studies have employed qualitative data to support and broaden the scope of their results.

3. Objectives and research questions

This study aims to illustrate the development of language accuracy in a group of learners who study English online by identifying the type of errors, the type of correction strategies that the teacher utilizes when interacting orally with the students in synchronous learning activities and the repair moves that these strategies generate. As another source of data that expands and illustrates the inferences from the quantitative analysis (Edith et al., 2017), this study explores the perceptions that the participants have about the types of errors that they sense they produce and how they think the participation in the online learning activities affects their development of language accuracy, how they think the teacher reacts when they make an error, and how they think they react to those corrections. Therefore, the present study seeks to answer the following research questions. Both, the objectives of this investigation and the research questions are informed by the error-treatment sequence, which frames this study into a theory-driven investigation. The error treatment sequence was proposed by Lyster and Ranta in 1997 and

claims that in a language course that aims at communication and during interaction, the sequence begins with a learner's utterance containing at least one error. The erroneous utterance is followed by the teacher's corrective feedback or not; if not, then there is topic continuation. If corrective feedback is provided by the teacher, it is either followed by uptake on the part of the student or not and the absence of uptake entails topic continuation. If there is uptake, the learner's initially erroneous utterance is either repaired or continues to need repair in some way. Lyster and Ranta continue explaining their model by stating that if the utterance needs repair, corrective feedback may again be provided; if the teacher does not provide further feedback, then there is topic continuation. They continue explaining that if and when there is repair, then it is followed by either topic continuation or by some repair-related reinforcement provided by the teacher. Following the reinforcement, there is topic continuation (p.45). Figure 5 summarizes the error-treatment sequence proposed by Lyster and Ranta (1997)
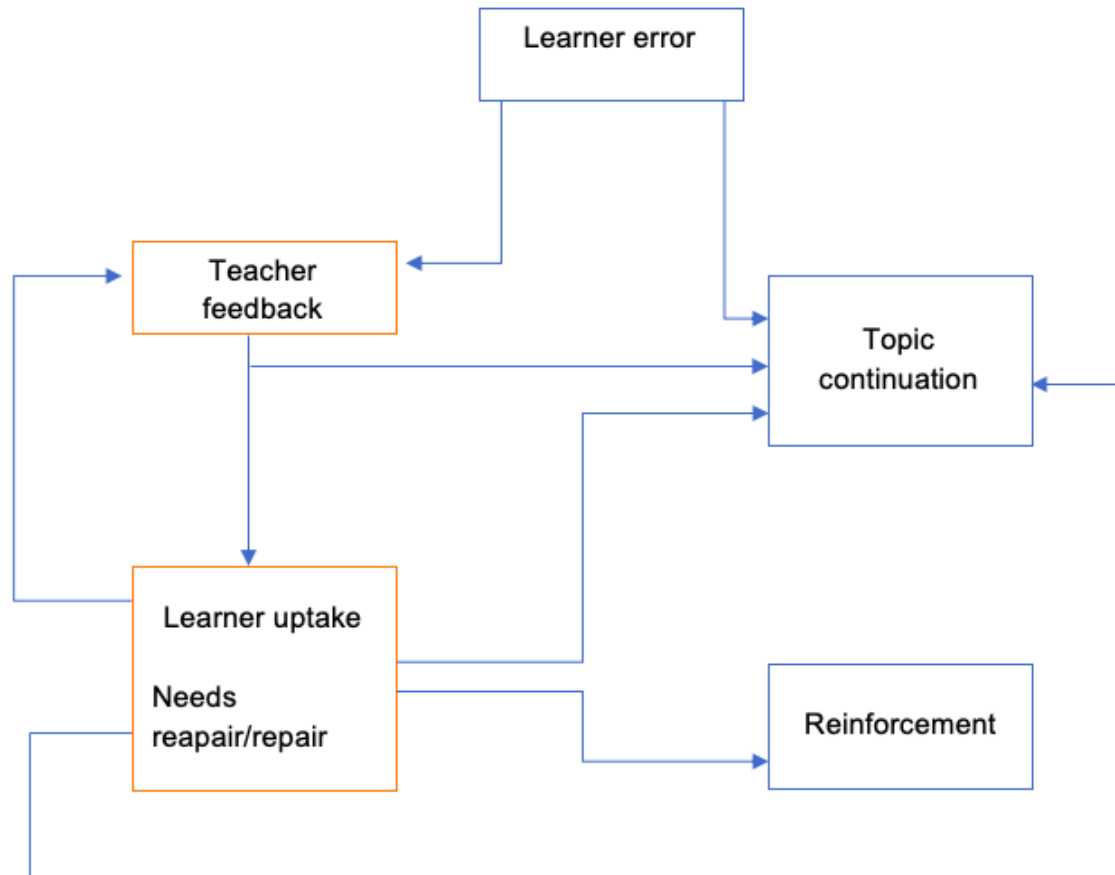
Figure 5. The error-treatment sequence model proposed by Lyster and Ranta (1997)

3.1 Research questions

RQ 1: What is the frequency and distribution of the errors that students produce during the course?

RQ 2: What type of error correction strategies does the teacher employ to correct errors when interacting orally with students and what type of repair moves do these correction strategies generate?

RQ 3: How does participation in synchronous learning activities affect error production, accuracy development, correction strategy use by the teacher and any subsequent repair moves by the learner, according to participants' self-reported impressions?

4. Method

This section deals with the methodology employed in this investigation to explore the development of language accuracy, the effects of the use of correction strategies on the part of the teachers in the production of repair moves in an online course of English. To do so, this chapter is divided into two sections. The first section describes the research design, including the participants, the design of the online course employed as a research scenario in this study, the type of study that this investigation follows, and the ethical issues that this study takes into account. The second section presents the procedure that was followed to collect data, including the instruments, how the data was treated and analyzed and how the development of accuracy was measured in this investigation. This section also discusses the convergence model of triangulation used in this investigation. This investigation triangulates the analysis of the transcripts from the oral production in the synchronous learning activities, the grades obtained and the analysis from the transcripts from the participation in in-depth interviews and a focus group.

4.1 Research design

This section explains the participants in the study, the design of the online course of English and the online learning activities that are the research scenario for this investigation. It also explains the type of study and the ethical considerations of this investigation.

4.1.1 Participants

The participants in this study are six students who are undertaking graduate studies (four females and two males) at a higher education institution. They are 39.5 years old on average and they have been studying English for 5.4 years on average. When asked about the educational level in which they have studied English, two students have studied English in their master's degree and in language courses, one student has studied English in high school and in

undergraduate courses, another student has studied English in high school, in a graduate diploma and in language courses, another student has studied English in high school, in his undergraduate studies and in his graduate diploma, and one student has studied English in high school and in his undergraduate studies.

Based on the Common European Framework of Reference (CEFR), five of the participants have an A2 level in spoken interaction, which means that they can communicate in simple and routine tasks that require simple and direct exchange of information and they can handle very short social exchanges. One of the participants has a B1 level, which translates into being able to deal with most situation that can emerge while traveling, also he can enter unprepared into conversations on topics that are familiar or pertinent to everyday life. In oral production, four participants have an A2 level. In other words, they are able to use a series of phrases and sentences to describe their family, other people, their living conditions, their educational background and their present and most recent job. Two of the participants have a B1 level in oral production, which means that they can connect phrases in a simple way to describe experiences, events, dreams, hopes and ambitions. They can also narrate a story or relate the plot of a book or film. They consider English as important or very important, as it is a requirement for the academic program they are pursuing. Table 10 details the information from the participants. Additionally, the course where this investigation takes place is framed in an institutional language policy that requires graduate students to demonstrate language competence. The policy states that they have to demonstrate communicative competence as described in the B1 level from the CEFR (Universidad de Antioquia, 2015). To comply with this policy, students can either take a test, which is calibrated according to the B1 level or they can take two courses that aim to develop written and oral skills and the abilities described at the B1 level. The courses are offered online. As there is not a sequence of courses and there is only one course for each skill (speaking and writing), learners who feel that they are not able to pass

the test, they take the courses, which results in multiplicity of levels, skills and abilities in the same course.

Table 10. Participants' information

Code	Gender	Age	Time studying English	Educational level in which they have studied English	Proficiency level	Importance of learning English	Reasons to study English
S1	Female	30-39	From 1 to 2 years	Master's degree and language courses	Spoken interaction: A2 Oral production: B1	Important or very important	It is a requisite of the academic program
S2	Female	30-39	From 3 to 5 years	High school and language courses	Spoken interaction: B1 Oral production: A2		
S3	Female	40-49	From 6 to 10 years	High school and undergraduate courses	Spoken interaction: A2 Oral production		
S4	Female	30-39	From 6 to 10 years	High school, language courses and graduate diploma	Spoken interaction: A2 Oral production: A2		
S5	Male	30-39	From 6 to 10 years	Master's degree and language courses	Spoken interaction: A2 Oral production: B1		
S6	Male	40-49	From 3 to 5 years	High school and undergraduate courses graduate diploma	Spoken interaction: A2 Oral production: A2		

4.1.2 The research scenario of the study or the online course employed in this investigation

The research scenario for this study is an online course of English entitled 'Development of Oral Skills (DOS)'. The course has been designed for students who are between basic users and independent users of the language (A2, B1) according to the CEFR. Although, DOS is not designed specifically to collect data for this study — it was originally designed to provide online language instruction at a higher education institution, as a language instruction possibility to fulfill institutional language requirements — the features and components of the online course lend themselves to explore the participants' production of errors, the reactions from the teacher to those errors, and the reaction from the students to those corrections.

The DOS course was designed from a socioconstructivist, a task-based and a content-based perspective because the content is taught through the study of a series of topics; each topic is broken in a systematic manner and from different angles, so the role of grammar structure is incidental (Jalilzadeh & Tahmasebi, 2014). The activities (task) that the students carry out in the DOS course have particular goals and their focus is communication (Hismanoglu & Hismanoglu, 2011; Klapper, 2003; Rosell-Aguilar, 2005). The DOS course uses synchronous and asynchronous technological tools for communication, and it runs on an institutional Moodle platform. The course has five units and each unit of the course has four sections:

(1) Teacher's zone. This area is only accessible to teachers and it includes the editable PowerPoint presentation that the teacher can use in the synchronous learning activities and the links to the videos, audios or readings that act as input in the synchronous learning activities. This section aims to allow teachers to adapt the materials to suit their students' needs and expectations, as the course advances.

(2) Lessons. They provide access to the video conference tool to participate in the synchronous learning activities, to the recording of previous synchronous learning activities, and to a video or an audio forum (asynchronous activities).

(3) Assessment. This part of the unit contains links to the assessment activities in the course. This section includes additional resources such as links to different sites that help students with grammar or pronunciation problems.

(4) Analytics. This section aims to provide participants with a tool to monitor their progress throughout the course. Additionally, the DOS course has a duration of 20 weeks, and the five units in the DOS course are an introductory unit and four thematic-based units. The titles for the units are: unit one or talking about fitness, unit 2 or manners and tips on the phone, unit three or jobs and occupations and unit five healthy living. In each unit there are two synchronous learning activities (online lessons) and two asynchronous activities (audio forums or video forums). The assessment activities of the course are two synchronous activities (online interviews), which take place at the end of the second and the fourth units and four asynchronous activities (podcasts) that take place at the end of each unit. Table 11 shows the characteristics of the DOS course.

The DOS course has four internal components: content, which refers to the different topics that are explored along the course, tasks that the students have to carry out during the course, contextualization elements, which are the guidelines, procedures, and tutorials that help the students navigate through the course, technological tools, which are the video conference tool, the audio and the video recording tool, and the learning management system that helps the students participate and interact in the course from a distance. Figure 6 explains the internal components of the DOS course in a diagram.

Table 11. Characteristics of the DOS course.

Development of Oral Skills (DOS)					
Characteristics	**Duration**	**Sections of the units**	**Thematic units**	**Activities in each unit**	**Assessment activities**
Content is taught through the study of a series of topics	20 weeks	Teacher's zone	Unit 0: introduction	2 synchronous activities (online lessons)	2 online interviews in the middle and at the end of the course
Tasks have particular goals and their focus is communication		Lessons	Unit 1: talking about fitness	2 asynchronous activities (audio forums or video forums)	4 asynchronous activities (podcasts) at the end of each thematic unit
Technological tools		Assessment	Unit 2: manners and tips on the phone		
Moodle platform		Analytics	Unit 3: jobs and occupation		
			Unit 4: healthy living		

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                          ┌──────────────┐
                          │  DOS course  │
                          └──────────────┘
        ┌──────────────────────┐      ┌───────────────────────┐
        │ Synchronous activities│      │ Asynchronous activities│
        └──────────────────────┘      └───────────────────────┘
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Online lessons	Online interviews	Audio-video forums	Podcast
Teaching	Assessment	Teaching	Assessment

Content	**Tasks**	**Contextualization elements**	**Technological tools**
Talking about fitness	Role-play	Guidelines	Video conference tool (Blackboard collaborate)
Manners and tips on the phone	Giving opinions	Procedures	Audio recording tool (http://clyp.it, http://online-voice-recorder.com)
Jobs and occupations	Matching meaning and words	Tutorials	Video recording tool (www.videomessageonline.com)
Healthy living	Matching images and words or expressions		

Figure 6. Internal components of the DOS course

4.1.3 Type of study

This is a qualitative case study with a mixed methods and a Computer-Mediated Discourse Analysis (CMDA) approach that combines both quantitative and qualitative analysis. For this investigation, mixed methods is the combination of both qualitative and quantitative research methods in a research study. There are many reasons why this study uses a mixed method design. First, because it broadens the understanding of a problem by incorporating both qualitative and quantitative research. And second, mixed methods designs help better understand, explain or build on the results from the qualitative and quantitative approaches.

(Creswell, 2009a; Creswell & Plano-Clark, 2011). Mixed methods designs can be integrated differently in a research study. For the case of this investigation, qualitative and quantitative approaches occur at different moments of the study. For example, at the research design because it helped define and answer the research questions of the study. At data collection because qualitative and quantitative data collection instruments were shaped to support each other. At the analysis level because the data from one strand were analyzed according to the procedures of that strand and then used to shape the analysis of data from the other strand. Finally, the mixed methods design was integrated in this investigation at the inference level because the study brings together the results from the qualitative and quantitative strands in a final interpretation. This investigation employs a contiguous approach to display interpretations because the quantitative findings are reported in one section and the qualitative ones in separate section (Creswell, 2014; Creswell & Plano-Clark, 2011; Schrauf, 2018).

This investigation also employs Computer-Mediated Discourse (CMD) to approach the understanding of the research problem. Computer-Mediated discourse (CMD) is the communication produced when human beings interact with one another by transmitting messages via networked computers. It focuses on language and language use in computer networked environments. It uses methods of discourse analysis to address that focus (Herring, 2004). CMDA is useful for this study because it adapts methods from language-focused disciplines such as linguistics, specially pragmatics, discourse-analytics and sociolinguistics or communications to the analysis of computer-mediated communication. Besides, it may be supplemented by surveys, interviews or ethnographic observations and it may involve qualitative and quantitative analysis (Herring, 2004). CMDA allows to examine participants' discourse practices, opinions, feelings and perception and observable patterns of language use. CMDA goes beyond what is observable on the screen (Androutsopoulos, 2008).

This investigation analyzes the oral production of leaners in synchronous learning activities, identifying the proportion of error production, the proportion of clauses that contain a correction strategy and the ones that contain repair moves. This study also analyzes the participants' insights of the effects of the synchronous learning activities, their opinions about the way the teacher corrects them, their perception on the development of language accuracy looking for patterns, behaviors and opinions. The specific approach to computer-mediated discourse analysis in this investigation is informed by a linguistic perspective and it is supplemented by the use of interviews and a focus group that broaden the scope of the analysis. As this investigation is framed in a socioconstructive perspective of language learning, CMDA and mixed methods approaches appear as convenient research approaches to analyze corrective feedback and learner uptake in synchronous learning settings that privilege communication. Additionally, this investigation employs a theory-driven approach because the error-treatment sequence model that has been explained thoroughly in different sections of this thesis informs the research design, the data collection, the analysis and the report of the findings (Creswell & Plano-Clark, 2011; Schrauf, 2018).

4.1.4 Ethical issues

According to Guichon (2017) the ethical considerations help researchers with the process of specifying and implementing the appropriate research designs. This study took into consideration five ethical issues: collecting, sharing, and displaying data along with the possible risks and benefits of participating in the study.

This investigation followed these ethical procedures. First, at the beginning of the DOS course the purpose of the study, the tools that were to be employed, the sources of data, the way the data would be treated were explained to the participants. There was also an explanation that the participation in the study would not have any impact on the course final assessment and that they could withdraw from the study at any point without any penalty. Besides, this study

complies with the regulations that protects personal information according to the Colombian law (Ministerio de comercio, 2013). Appendix 1 shows the consent form used before participation in the study. This information was reinforced at the beginning of each data collection activity (in-depth interviews, a focus group). Second, although this investigation never considered individual performances, as all the measures were expressed in terms of percentages, means or standard deviations, for anonymity of the participants in the study, their names and pictures were never used and they were identified with a code as student 1 (S1), student 2 (S2), student 3 (S3), and so on, and when necessary, the teacher was identified as T. The participants' pictures were removed from the screenshots of the course and were replaced with pictures that represent an unknown user. Third, the participation in the study was voluntary and only the individuals who agreed to participate had access to the data, once collected, upon request. Finally, the corpus resulting from this study, as well as the details of the investigation were only shared with my thesis supervisor.

4.2 Data collection

Data for this study came from three sources: (1) the oral performances in the synchronous learning activities, (2) the participation in a focus group with students (6) and in-depth interviews with 5 students and another one with their teacher and (3) the grades that the learners obtained in the assessment activities during the course (podcasts at the end of each unit and online interviews in the middle and at the end of the course).

4.2.1 Instruments to collect data from oral performances in synchronous learning activities

The synchronous learning activities play two roles in this research experience. On the one hand, they are teaching activities and assessment activities as they provide language instruction and instances to assess the development of oral language skills as has been explained

previously in this thesis. On the other hand, they are research instruments as they generate the oral performances, which were analyzed in order to identify the number and types of errors produced, the correction strategies the teacher uses, and subsequent repair moves on the part of the learners. This section of the thesis includes a description of the synchronous learning activities, and how they were used to generate the oral performances that were collected and analyzed in this investigation.

4.2.1.1 Synchronous learning activities (online lessons)

The online lessons are synchronous sessions that employ a video conference tool. This tool simulates the dynamics that take place in a traditional classroom, it has a board where the teacher displays PowerPoint presentations or uses links to other sites and videos. Based on the task cycle proposed by Ellis (2003), the online lessons have:

(1) A pre-task stage that aims at activating background knowledge and helping participants familiarize with possible unknown words or expressions.

(2) A while-task or during-task stage in which participants have to work with information in the target language.

(3) A post-task stage in which participants have to create a final learning product with the information and language learned in the previous stages. The tasks in each stage have been especially designed taking into consideration the particularities of the technological tool employed (Blackboard Collaborate), the learning management system (Moodle), the topic of the lesson, the material utilized, and the learning objective to be achieved (Hampel, 2006; Hampel & Stickler, 2012; Rosell-Aguilar, 2005).

The activities that the online lessons contain are designed to trigger interactions between the teacher and the students and among the students. Therefore, the teacher asks each student's opinions as also their classmates' opinions and other strategies such as to provide descriptions,

support answers, make decisions, etc. to stimulate a conversation. Table 12 illustrates some of

the activities designed for each stage in the online lessons (pre-task, while-task and post-task).

Table 12. Activities designed for each stage in the online lessons

Unit	Online lesson	Topic	Pre-task activities	While-task activities	Post-task activities
Unit 1	Online lesson 1	Talking about fitness	**Brainstorming** Provide a short description of a series of images **Matching** Match the image with a word that best describes it. Match expressions and images	**Comparing** Read two different texts and compare the reasons to workout	**Giving opinions and arguments** Half the group states the advantages and the other half states the disadvantages of working out.

As the online lessons are video conferences and depending on the broadband and to

avoid technical and communication problems, learners can use video or only audio to

participate. The video-conferencing tool employed to carry out the online lessons also includes

a chat box where the participants can ask questions or include comments. For the purpose of

this study, the interaction in the chat were not considered because the study focuses on the oral

productions in the synchronous learning activities. At the end of each online lesson, the video

conference tool automatically records the online lesson session for future reference. Figure 7

shows the interface of an online lesson.
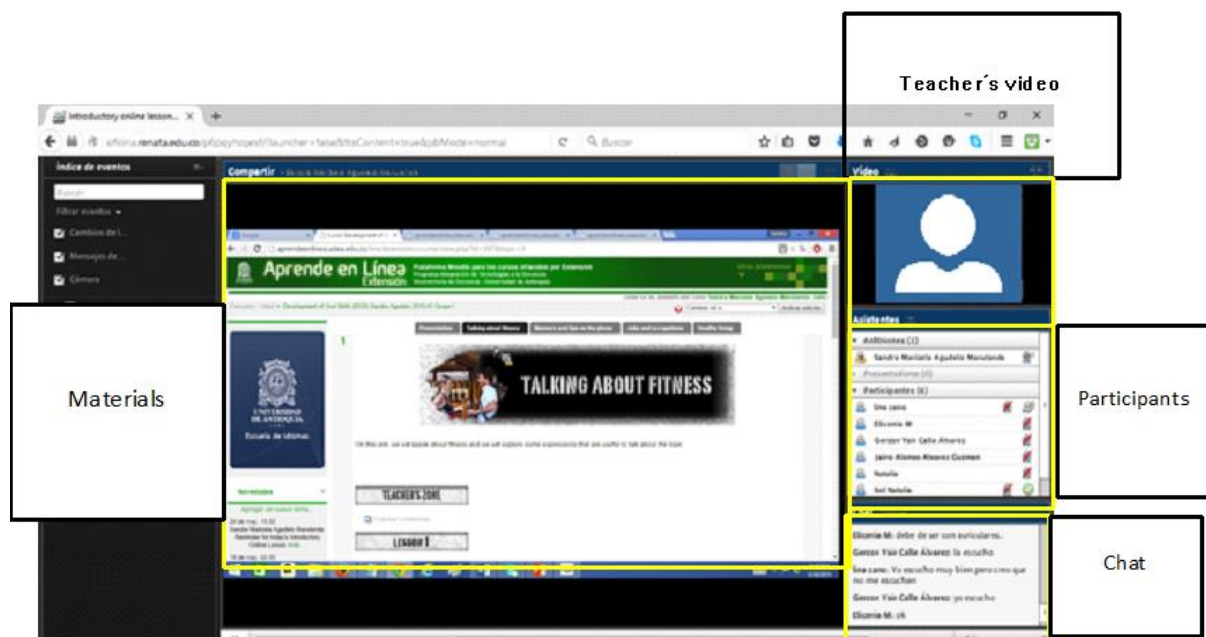
Figure 7. Online lesson interface

4.2.1.2 Synchronous learning activities (online interviews)

The online interviews are synchronous meetings that use a video conference tool. As opposed to the online lessons where the meetings are between the teacher and the whole group, the online interviews take place between the teacher and each student at a time. There are two online interviews during the DOS course: one in the middle of the course or mid-term interview and one at the end of the course or final interview. The structure of the online interviews is simple, they have a section in which the participants introduce themselves and another section in which the teacher asks questions about the topics discussed previously in the online lessons. Each online interview has a set of guidelines that aim to solve technical issues, assessment issues, and they provide a glimpse of the tasks that the student have to complete during the interview. The online interviews are designed to be assessment activities. Table 13 shows the guidelines employed in the mid-term online interview. During the online interviews the teacher can display PowerPoint presentations, use links to other sites, and videos to accompany the

activities or to stimulate the oral production. Similar to the online lessons, depending on the broadband and to avoid technical and communication problems, during the online interviews the participants can use video and audio or only audio to participate. Figure 8 illustrates the online interview interface.

Table 13. Guidelines for the online interviews

Universidad de Antioquia
Escuela de Idiomas
Development of Oral Skills (DOS)
Midterm Interview Guidelines
Technical recommendations and logistics
- Make sure your microphone works correctly as well as your internet connection
- Make sure you are in a quiet and comfortable place, away from kids, relatives or friends who might interrupt.
- Log in to Renata Midterm Interview at least 10 minutes before the agreed time.
- Be on time. If you cannot attend on time, your interview will not take place.
- No interviews will take place unless you are on time.

Remember that this is a conversation and it will take place in a relaxed atmosphere.
Parts of the interview
- The interview has two parts.
    - In the first part, you will introduce yourself briefly, no more than two minutes. You have to state your name, your ID, your profession/ occupation, your program of study at the university or your study plans.
    - In the second part of the interview, you have to answer two questions about the units we have studied. These questions have to do with the discussions held in the online lessons and the topics studied in the previous units.
- You should not take less than two minutes to answer each question and no more than four minutes.
  Your tutor might ask you extra questions according to the conversation to complete or clarify your answer.

Grading
- Your tutor will not provide immediate feedback on the interview so do not ask questions about it after the interview.
- Your tutor will provide feedback timely through the appropriate space in the platform.
- Once you finish your interview, go to the **AUTOEVALUACIÓN ENTREVISTA PARCIAL** and self-assess your performance. This will give you an idea of the problems you may have and what aspects you may have to improve.

Figure 8. Online interview interface

4.2.1.3 Asynchronous online learning activities (podcasts)

Podcasts are audio files that the participants create using their computers, a microphone, and software in a tool embedded in the course. The podcasts in the DOS course correspond to the assessment activities at the end of each thematic unit and there are four podcasts in the course. The objective of the podcasts is to use the language, content, and information explored during the online lessons, thus providing an opportunity to improve students' oral skills in general and language accuracy in particular. Participants can write, look up words in a dictionary, and rehearse the task as many times as necessary before recording it and uploading it into the tool. Although, the course employs a Moodle tool to record the podcasts, an alternative recording tool is available, together with a tutorial, in case the Moodle tool fails. Figure 9 shows the features of the recording tool in Moodle. Table 14 displays the instructions for the podcast in unit two (manners and tips on the phone) in which students have to play six roles: (1) an advisor from a communication company who provides suggestions and tips to

make phone calls abroad, (2) a professor from a very prestigious university who lectures on appropriate behavior on phones and its consequences on social lives, (3) an advanced student of English who has to prepare a talk on cellphone etiquette, (4) an owner of a very important start-up company who gets many calls from foreign countries and who does not know how to answer them appropriately, (5) an employee of a very important company whose workmates have very inappropriate behavior when using the phone in meetings and other social gatherings, and (6) a parent whose wife and kids have inappropriate behavior on their phones at home. In the podcasts, the students have to solve a problem related to the appropriate use of the phone by providing tips or suggestions. The students are advised to record a one-minute podcast using the vocabulary, expressions, and information explored in the online lessons during the unit. Besides, the students are required to sound as natural as possible and to avoid reading and are encouraged to use notes to remind them of the main points of their presentation. They are also told to practice several times before uploading the file into the platform.

Figure 9. Features of the recording tool in Moodle

Table 14. Instructions to complete the task for the podcast in unit 2

Universidad de Antioquia Escuela de Idiomas
Development of Oral Skills (DOS)
Role plays
Preparing your podcast

Record a podcast of **approximately one (1) minute** using the vocabulary, expressions and information you learned in the two previous online lessons. In your podcast, you have to play one of the roles your teacher assigned you.

Recommendations:

Try to sound as natural as possible. Try **NOT** to read from a text, instead use **notes** to remind you of the main points of your presentation.

Practice several times before recording and listen to your recording before uploading it into the platform. Remember that **YOU ARE RESPONSIBLE FOR ENSURING THAT YOUR TEACHER IS ABLE TO HEAR YOUR RECORDING**. If you have problems do not hesitate to contact your teacher.

Roles

Role 1. Advisor from a communication company	**Role 2.** Professor in a very prestigious university	**Role 3.** Advanced student in an English course
Role 4. Owner of a very important start-up company	**Role 5.** Worker for a very prestigious company	**Role 6.** A family person with a spouse and kids

4.2.2 Instruments to collect information from the in-depth interviews and the focus-group

This study also analyses data from in-depth interviews to students and the teacher and a focus group to the students to illustrate the inferences that are obtained from the analysis of oral performances of the participants in the course. As Edith, Díaz, & Miy (2017) claim:

"Using qualitative instruments allows to embrace an interpretative perspective that sustains that any attempt to understand reality must be based on the experiences of people in social reality."

4.2.2.1 In-depth interviews

This study used in-depth interviews because they allowed the researcher to identify sensitive information that the participants did not feel comfortable sharing in front of other people. The process to set up the in-depth interview started by explaining its purpose, pointing out that the interview would be audio recorded, indicating that the identity of the respondents would be confidential, and mentioning that the interview would be transcribed for analysis purposes. After that, a consent form that the participants read and signed was also presented. The in-depth interviews used a protocol that had four sections to guide them, which was designed based on Boyce & Neale's (2006) guide for designing and conducting in-depth interviews (see appendix 2) and was validated by consulting a panel of experts who gave recommendations about the questions, the layout and the administration of the instrument. The protocol was divided into four sections. The first section of the protocol contained the objective of the study. The second section explained the dynamics of the interview, detailing the steps to set it up. The third section had a set of general questions that created a relaxed atmosphere and sought to explore the participants´ general opinions about the synchronous activities. This section included questions where learners could provide feedback about the course and all its

components, which will not be analyzed due to the fact that they fall out of the scope of the present study. The fourth section of the protocol contained a set of specific questions that sought to deepen into the types of errors that the participants perceived as frequent, the types of correction strategies from the teacher that they identified, and the type of reactions that they perceived they had when the teacher corrected them. Appendix 2 shows the protocol employed to carry out the in-depth interviews with the students. Appendix 3 shows that the in-depth interview with the teacher used a slightly different protocol because it explored the same aspects, but from the teacher's point of view.

4.2.2.2 Focus groups

This investigation used focus groups because, as Grudens-Schuck, Allen, & Larson (2004) suggest, they allow to gain multiple perspectives about an issue in an interactive group setting, because one participant's comment can feed off another comment and so on. In the case of this investigation, the focus group allowed to dig deep into the perception of the synchronous learning activities and the use of corrective feedback on the development of language accuracy.

The procedure to set up the focus group was the same procedure and validation process to set up the in-depth interviews, the only difference was that the protocol to guide the session had five sections instead of four. The first section contained the title of the investigation and the purpose of the study. The second section presented the dynamics of the session. The third section displayed a set of general questions that sought to gain a general idea of the opinions that the participants had about the effects of synchronous learning activities, and to create a relaxed atmosphere to carry out the activity. The fourth section contained a set of specific questions to deepen the insights that the participants had about the type of errors that they thought they produced in the synchronous learning activities, the perceptions of correction strategies that the teacher utilized, the repair moves that they thought they utilized, and the insights about how they perceived their development of language accuracy, by contrasting their

performance at the beginning and at the end of the course. The fifth section contained a set of questions that sought to get information about the effects of synchronous learning activities that may not have been mentioned in the previous sections. Appendix 2 shows the protocol employed in the focus group with students.

4.3 Measures for the development of language accuracy and definition of the basic unit of analysis employed in this study

According to Foster and Wigglesworth (2016), there are two commonly used measures of accuracy in L2 performance: local measures and global measures. They claim that local measures aim to track the use of designated grammatical features (verb tenses, use of grammar or lexical features that can be problematic to learn in a language) and global measures focus on gauging the overall level of accuracy in an oral or written performance. They argue that the most commonly local measures are (1) Supplied in Obligatory Context (SOC), (2) Target-Like Use (TLU) and (3) Used in Obligatory Context (UOC). They state that SOC is applied by counting all the occasions in an L2 text where the chosen grammatical feature is obligatory and correctly supplied. TLU takes account of oversuppliance and OUC is the accuracy measure that gauges the degree of overuse of a grammatical feature. They state that local measures can be useful for measuring the development of specific morphological or grammatical features across time. However, development in control of an L2 structure is not necessarily linear, so conclusions about its progress at any given point are not straightforward. The studies explored in the literature review of this thesis are a good example of the use of local measures to assess he development of language accuracy.

Global measures, on the other hand, examine the text or transcript in its entirety. They work by dividing the data into units (100 words) to calculate the number of error every 100 words or into syntactic units (AS Units or Assessment of Speech units, T Units or Terminal Units, which refer to a main clause plus any subordinate clause and modifiers attached to it or

clauses) and they calculate accuracy by measuring the proportion of the units have errors (Foster & Wigglesworth, 2016). As this investigation is concerned with describing the progress of the development of language accuracy and the use of correction strategies and repair moves from the analysis of the transcripts from the oral performances during a 20-week period, therefore this study uses global measures to evidence that progress because it calculates the percentage of clauses that contain errors, correction strategies and repair moves in the synchronous learning activities in the course. This investigation uses the clause, understood as an utterance that contains a finite verb, as basic unit of analysis (Delahunty, Jones, & Verenikina, 2014; Espasa, Guasch, & Alvarez, 2013) because it allows a more finely grained analysis of oral data (Foster & Wigglesworth, 2016). This study also uses the error-treatment sequence proposed by Lyster & Ranta (1997) to describe the use of correction strategies and repair moves that are subsequently employed as evidence of the development of language accuracy.

Another measure of the development of oral language accuracy in this investigation was analysis of the grades that the learners obtained in the assessment activities (podcasts and online interviews) in the course. The assessment activities in the course are four podcasts (one at the end of each unit) and two online interviews (one in the middle and one at the end of the course). These activities are assessed using the descriptors that go from basic (A1) to advance (C2) based on the CEFR on these aspects of the spoken language: range, accuracy, fluency, interaction (only for the online interviews) and coherence. According to the descriptor that best suits the learner's performance, the teacher assigns a grade that goes from 0.0 to 5.0 and the passing grade is 3.0. These grades are calculated identifying means and standard deviations as indication of the development of language accuracy. For the purpose of the present research, only the grades assigned to accuracy are included.

4.4 Data treatment

This study uses the clause, understood as an utterance containing a finite verb as a predicate (Delahunty et al., 2014; Espasa et al., 2013) as basic unit of analysis. After identifying the clauses, the following step was to identify the errors, the correction strategies, and the repair moves, and to assign a tag or code to each category following Lyster & Ranta's (1997) categorization of errors, corrective feedback moves, and students' reactions to feedback.

4.4.1 Coding the errors

To identify and code errors, this investigation follows these steps. First the oral performances in the synchronous online learning activities were transcribed. After that, the transcriptions were contrasted with the audio files checking for any inconsistency. Then, the clauses were identified from the transcriptions. The first types of errors that were identified were the phonetic errors by listening to the audio file and tagging the error in the clauses. The other type of errors were tagged by looking for inaccurate uses of the linguistic items in the clauses or by looking at deviations from the standard use of linguistic items. When a doubt with coding a clause was found, help from my thesis supervisor was asked to solve the problem or I used the Corpus of Contemporary American English (https://corpus.byu.edu/coca/) that helped me determine whether a clause had an error and what type of error it had. Error identification was an easy task in this investigation because the participants' language proficiency is low, they are prone to produce a great variety of errors and with my experience as a teacher of English, it was easy to identify and categorize errors. I also shared with my thesis supervisor a segment of the dataset that represented 10% of the whole dataset, so she could code errors, correction strategies and repair moves. When we found a discrepancy, we discussed it and agreed on the codification.

4.4.2 Coding correction strategies and repair moves

To identify the correction strategies and the repair moves in the synchronous learning activities, this study adapted the error-treatment sequence proposed by Lyster & Ranta (1997). Once the clauses were identified, the following step was identifying the clauses that contained at least one error. The next step was to search for the reaction from the teacher (correction strategy) and the subsequent reaction from the student to the correction by the teacher (repair move). This procedure allowed me to tag the clause, the error, the learning activity where the error took place, the participant who made the error, the correction strategy the teacher employed, and the reaction from the student. Table 15 details the tags employed to identify the errors, correction strategies, and repair moves.

Table 15. Tags for errors, correction strategies and repair moves based on Lyster and Ranta (1997)

	Type of error	Codes or tags
Grammatical errors	Article errors	ARTI_GR_ERR
	Pronoun errors	PRON_GR_ERR
	Verb errors	VER_GR_ERR
	Preposition errors	PREPO_GR_ERR
	Auxiliary errors	AUX_GRA_ERR
	Word order errors	WoO_GR_ERR
	Inappropriate uses of affixes	PRE_SUF_GR_ERR
Lexical errors	Word omission errors	WoOM_GR_ERR
	Inappropriate word choice	IN_CHOI_LEX_ERR
	Unsolicited uses of L1	U_u_L1
Phonetic errors	Mispronunciation or vowel or consonant sounds	V_C_PH_ERR
	Addition or omission of sounds	AD_OMI_PH_ERR

	Absence of linking	NO_LINK_PH_ERR
	Inappropriate uses of stress and intonation	STR_INTO_PH_ERR
	Incomprehensible sounds	NOCOMPREN_PH_ERR
Correction strategies		**Codes**
Explicit corrections		E_C
Recasts		R
Elicitation		E
Metalinguistic clues		M_L_C
Clarification requests		C_R
Repetitions from the teacher		R
Repair move		**Code**
Student repeats teacher's correction		STU_REPEAT
Student incorporates teacher's correction		INCOR_TS_REF
Student self-repairs		SELF_REP
Student provides a yes/no response		YES_NO_REP
Student hesitates		HESIT_REP
Student makes the same mistake		SAME_MISTA_RE
Student partially repairs		PART_REAP

4.5 Data analysis

4.5.1 Analysis of the students' production in the synchronous learning activities

The data extracted from the students' oral production in the synchronous learning activities were analyzed in two phases. The first phase was the identification in each clause of the presence or absence of single items such as deviant uses of article errors, verb, auxiliary.

The use of correction strategies such as explicit corrections, clarification requests that the teacher used to help learners notice errors. The use of repair moves such as repetitions, incorporations, and so that the learners employ to fix an inaccuracy or error. For this identification, this study employed a binary code in which '1' indicated the presence and '0' indicated the absence of the inaccuracy. In this phase, the frequency of each error, correction strategy, and repair move was identified. This investigation employed a matrix with 33 columns in an MS Excel spreadsheet to register those data. Appendix 4 shows the matrix employed to collect the data from the oral performances in the synchronous learning activities.

The second phase classified the results from the previous analysis into grammatical, lexical, and phonetic errors, correction strategies and repair moves, and synchronous technologies; less explicit and more explicit correction strategies, unsuccessful repair moves, and successful repair moves. This phase provided a wider view of the data and I was able to establish relationships between the data. For example, unit and type of error or more explicit correction strategies and successful repair moves. The data on this level allowed to use descriptive statistics to present the results from both analyses in the form of graphs and tables using SPSS. From this analysis, the percentage of errors in the synchronous learning activities, the percentage of errors during the course were calculated, together with means and standard deviations. That analysis helped me identify the progress of the development of accuracy. Also, the percentage of clauses that have a correction strategy and the percentage of clauses that contain a repair move were calculated. This analysis helped identify the error treatment sequence and how it relates with the development of oral language accuracy.

4.5.2 Analysis of the in-depth interviews and the focus group

The transcripts from the in-depth interviews to the students and to the teacher and the focus group to students were analyzed using open codes, which refer to major categories of information and then with axial codes, which refer to the categories that emerge from the major

categories. Open codes and axial codes help categorize and synthesize the emerging themes (Creswell, 2007). To carry out the analysis of the transcripts from the in-depth interviews and the focus group, I employed NVivo 10, which is a software for qualitative data analysis, and it is based on the principles of open and axial codes. In this analysis, I identified these open codes, which are broad categories: general perceptions and feelings about the course, the teacher, the content, the synchronous learning activities, the strategies that the teacher employed to correct errors and the benefits of the online learning activities on accuracy. A second analysis helped identify these axial codes, which are narrow categories: the perception that the participants had about the use of strategies to correct errors (the impact, use and identification of corrections strategies), the perceived benefits of the synchronous learning activities and how those activities enlarged teaching skills. At a narrower level of analysis, these categories were identified: the types of errors, the process to correct errors, feelings when making errors and feelings when errors were corrected. Figure 10 summarizes the process to analyze the data gathered from in-depth interviews and the focus group.

FIRST ANALYSIS	OPEN CODES	→	General perceptions and feelings about the DOS course, the teacher and the content, the learning activities (online lessons, online interviews, audio and video forums and podcasts), strategies to develop language accuracy and effects of online learning activities
SECOND ANALYSIS	AXIAL CODES (1)	→	Utilization of strategies and technological tools, impact, use and classification of correction strategies, benefits of learning activities and enlargement of teaching skills
THIRD ANALYSIS	AXIAL CODES (2)	→	Types of errors, process to correct those errors, feelings when making errors and feelings when a correction was deployed and process when errors were detected.

Figure 10. Analysis of in-depth interviews and the focus group

4.6 Triangulation of data in this study

As Latiesa (2003) states, when carrying out an investigation, researchers face several problems. For example, the research instruments that they use are not totally reliable or valid because they do not exclusively reflect differences in the characteristics studied because human behavior is influenced by multiple factors. She advises the use of various instruments when carrying out research in order to increase the levels of reliability and validity. Clark & Creswell (2015) call the use of several instruments to investigate a phenomenon as triangulation. Triangulation of data helps improve validity and reliability and its purpose in this study is to

"obtain different, but complementary data on the same topic to best understand the research problem" (Clark & Creswell, 2015). The data triangulated in this study are the analysis of the oral performances in the synchronous learning activities (online lessons and online interviews) with insights from the in-depth interviews and the focus group and the grades that the teacher assigned when assessing the development of oral language accuracy during the assessment activities in the DOS course.

The triangulation design procedure that this investigation followed was the convergence model, which consists of implementing quantitative and the qualitative research methods in the same timeframe, with equal weight (Clark & Creswell, 2015). The objective of using the convergence model of triangulation was "to end up with a valid and well-substantiated conclusion" just as Clark & Creswell (2015) have stated. Creswell (2009) states that under the convergence model of triangulation, the researcher collects quantitative and qualitative data concurrently and then compares the two databases to determine if there is convergence, differences, or some combination. He carries on explaining that the objectives of the convergence model of triangulation are to merge the data, to integrate or to compare the results of the two databases. Finally, he argues that usually after having applied the convergence model of triangulation, researchers first provide quantitative statistical results followed by qualitative quotes that support or disconfirm the quantitative results.

In the case of the present investigation, the convergence model of triangulation was employed as follows. First, the data from the oral productions in the synchronous learning activities was captured and transcribed. After that, it was analyzed and percentages, means and standard deviations of clauses containing errors together with the percentage, means and standard deviations of clauses containing correction strategies and the subsequent repair move. From this analysis, frequencies and tendencies were identified. Simultaneously, the transcripts from the in-depth interviews and the focus group were analyzed looking for themes and topics that

helped me support and illustrate the results from the statistical analysis. This comparison also helped me identify themes that broadened the understanding of the effects of the synchronous learning activities on issues that go beyond error production or error correction.

To sum up, the data from the in-depth interviews and the focus group were collected separately and the different results were compared and contrasted in the analysis stage of the research. Figure 11 outlines the triangulation design procedure and the convergence model that this investigation employed.
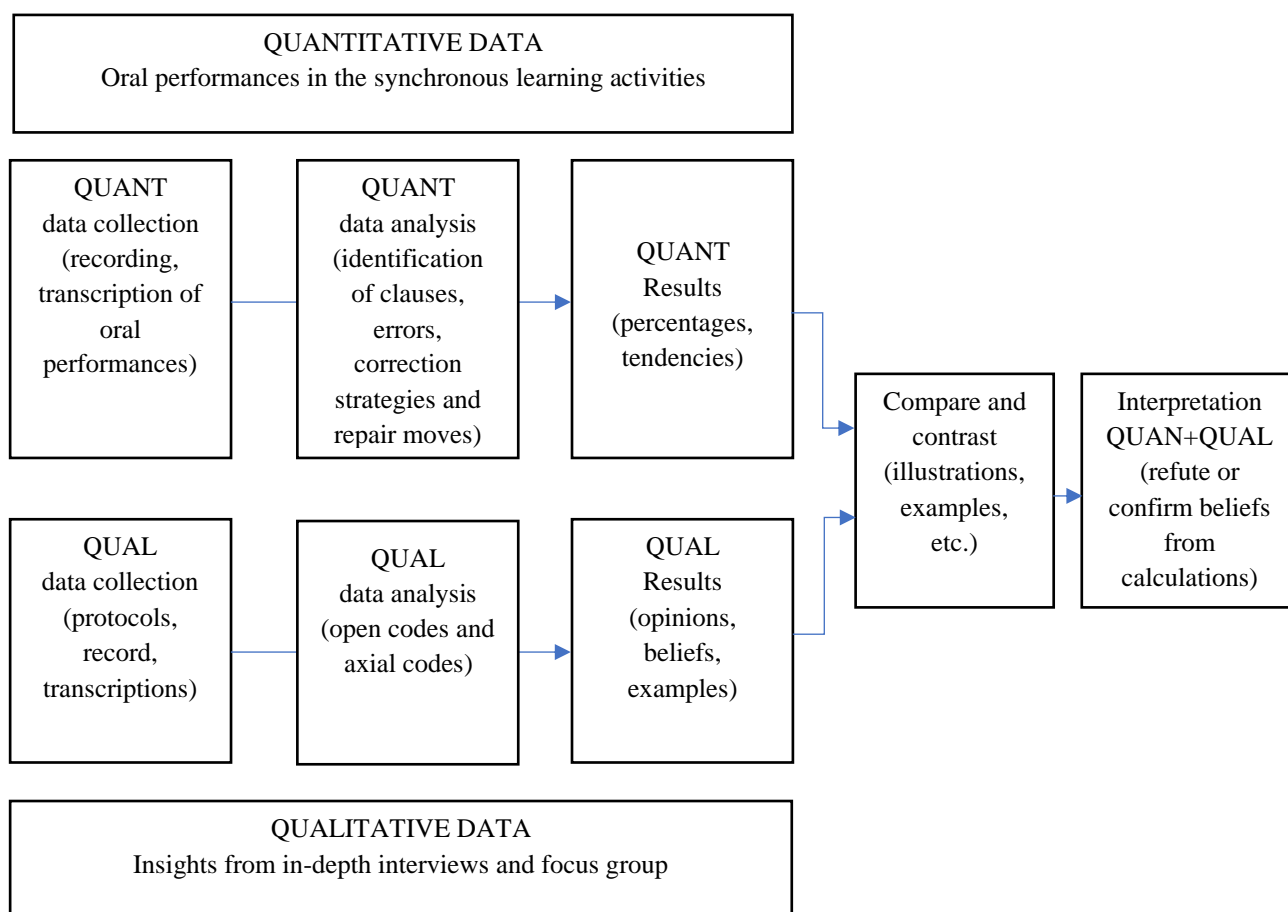

Figure 11. The triangulation design procedure employed in this investigation based on Clark & Creswell (2015)

4.7 Summary

This study analyzes the oral performances in synchronous learning activities in an online course of English by identifying the clauses containing errors using the categories proposed by

Lyster & Ranta (1997) as grammatical errors, lexical errors, and phonetic errors. Using the clause as basic unit of analysis, the present study also identifies the clauses in the synchronous learning activities where the teacher uses correction strategies and successive repair moves on the part of the learners, using the error treatment sequence proposed by Lyster & Ranta (1997). This study analyzes the data gathered from in-depth interviews and a focus group using Creswell's (2007) open codes that explored the opinions and insights of the participants trying to acquire general opinions about the course, its content, the online learning activities, and axial codes, which go deeper into the data, identifying the type of errors that the participants think they made, the online learning activities that are felt to be conducive to produce errors, the effects that the participants think the online learning activities and teacher's corrections have on the development of language accuracy. The study uses data triangulation (Clark & Creswell, 2015) that aims at confronting the data from the oral performances in the course and the insights from the in-depth interviews and the focus group in this case, to improve the levels of reliability and validity.

5. Results

This section presents the findings of this investigation after analyzing three sources of information: (1) the transcripts from the oral performances in synchronous learning activities in the course, (2) the transcripts from the participation in the in-depth interviews and a focus group and (3) the analysis of the learning outcomes (grades) that the learners were assigned in the assessment activities of the course. This section is divided into three parts that aim at answering each of the research questions.

The first section describes the learners' accuracy levels in synchronous oral learning activities, attempting to provide an answer to the first research question, which seeks to illustrate the evolution of learners' oral accuracy throughout the online course. This section

explores the language accuracy from several points of view. Namely, examining the amount and types of errors learners produce in synchronous learning activities along the four units of the course and providing an account of the grades that the teacher assigned in each assessment activity in the course as an additional measurement of the participants' accuracy levels.

The second section of this chapter analyses the correction strategies that the teacher used when interacting orally with students in the synchronous learning activities and the type of repair moves that these strategies generated. This section comprises an exploration of the most frequent correction strategies and the most common repair moves in the synchronous learning activities. This section seeks to answer research question two.

The last section explores how the participants in the online course perceive their performance during synchronous learning activities regarding the production of errors, the development of language accuracy, and the selection of repair moves after their teacher's feedback. This section attempts to answer the secondary research question, which seeks to complement the analysis of the participants' oral performances in the course.

The first two parts of this section provide the descriptive statistics, which include the number, frequency and proportion of errors and error types in synchronous learning activities, and the proportion of errors per unit and per participant. The means and standard deviations of the grades that the learners were assigned in the assessment activities are provided as additional data, which can portray the evolution of learners' language accuracy throughout the course. The third part of this section explores the level of awareness as well as the perceptions learners have about the errors they produce, the evolution of their language accuracy, their teachers' correction strategies and their subsequent repair moves.

5.1. Production of errors during the synchronous learning activities

This section analyzes the production and types of errors in the synchronous learning activities along the course. Table 16 shows that on average the participants in the course produced a higher number of errors in the second and the fourth unit of the course (N=536 and N=510 respectively). However, a closer look at the data, considering the rate of errors in each unit, reveals that the students produced a higher proportion of errors during units two and three, but the proportion of errors drops in the last unit of the course.

Table 16. Clauses with errors in the synchronous learning activities along the course

	Clauses with errors	N clauses per unit of the course	Clauses with errors / Total number of clauses per unit
unit 1	394	504	0.78
unit 2	536	664	0.81
unit 3	469	564	0.83
unit 4	510	660	0.77
Total	**1909**	**2392**	**Mean** .80 **Sd** .02

The descriptive analysis of the participants' production of errors, shown in Table 17, reveals that on average, learners produced 0.79 clauses with errors in the synchronous learning activities. Looking at the production of errors per student, we can see that only two students, S1 with 37.5% of the errors and S3 with almost 29% of the total errors, produced the highest amount errors. However, S6 and S5 produced less errors than the average because the first quit the course after the first unit and the latter did not finish the last unit of the course. However, when observing the mean number of errors produced by students, we can observe that most of them produce errors at a similar rate, ranging between .76 and .82 M=.79 (SD=.02). Therefore, the production of errors across units portrayed above is representative of all students. Due to the small sample size (6 students) and missing data (two students not completing the course) a statistical analysis including individual students' data could not be conducted to determine main effects of time on accuracy levels.

Table 17. Number of clauses and clauses with errors per student

Number of clauses and clauses with errors per student

	Clauses per student	Errors per student	% of errors per student	Mean numbers of error	Mean	Sd
S1	715	569	37.5	0.80		
S2	360	283	18.9	0.79		
S3	547	449	28.7	0.82		
S4	462	374	24.2	0.81	0.79	0.025
S5	230	175	12.0	0.76		
S6	78	59	4.1	0.76		
Total	**2392**	**1909**				

Regarding the types of errors produced in the synchronous activities, the number of clauses with grammatical errors is higher than all other types of errors (N=1818, 95%), followed by lexical errors (N=77, 4%) and very few phonetic ones (N=14, .07%). Figure 12 shows the proportion and number of clauses containing grammatical, lexical and phonetic errors. Given that the clause was the unit of analysis chosen for this study, when examining the data, we have to take into account that one clause can contain more than one type of error at a time. It's not uncommon for a clause to have phonetic, lexical and grammatical mistakes.
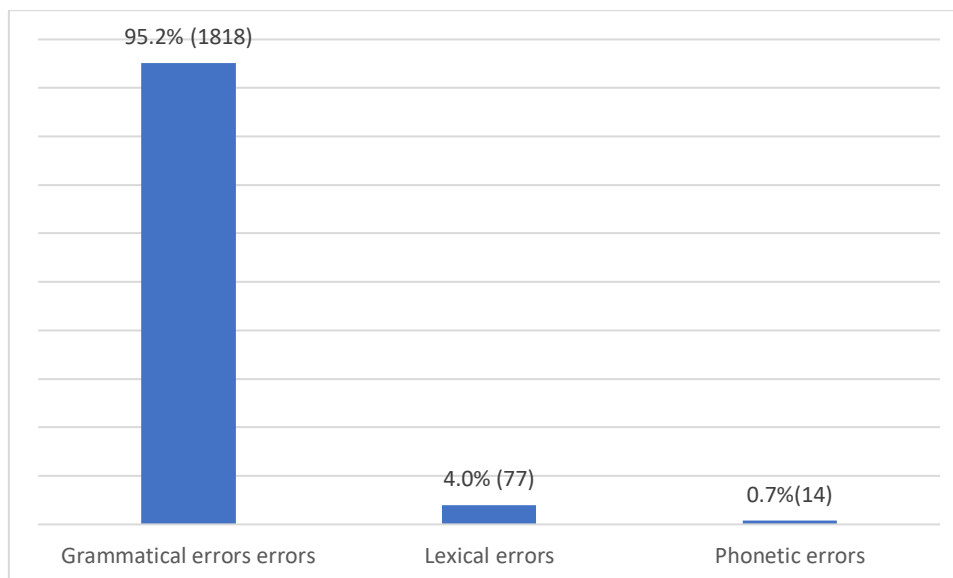
Figure 12. Proportion of grammatical, lexical and phonetic errors.

The most common mistakes that learners produced in the synchronous learning activities, displayed in Figure 13, had to do with choosing the right article (N=553, 29%), the right pronoun (N=516, 27%) and errors with verbs which had to do both with using the right tense and picking the right lexical item (N=358, 19%).
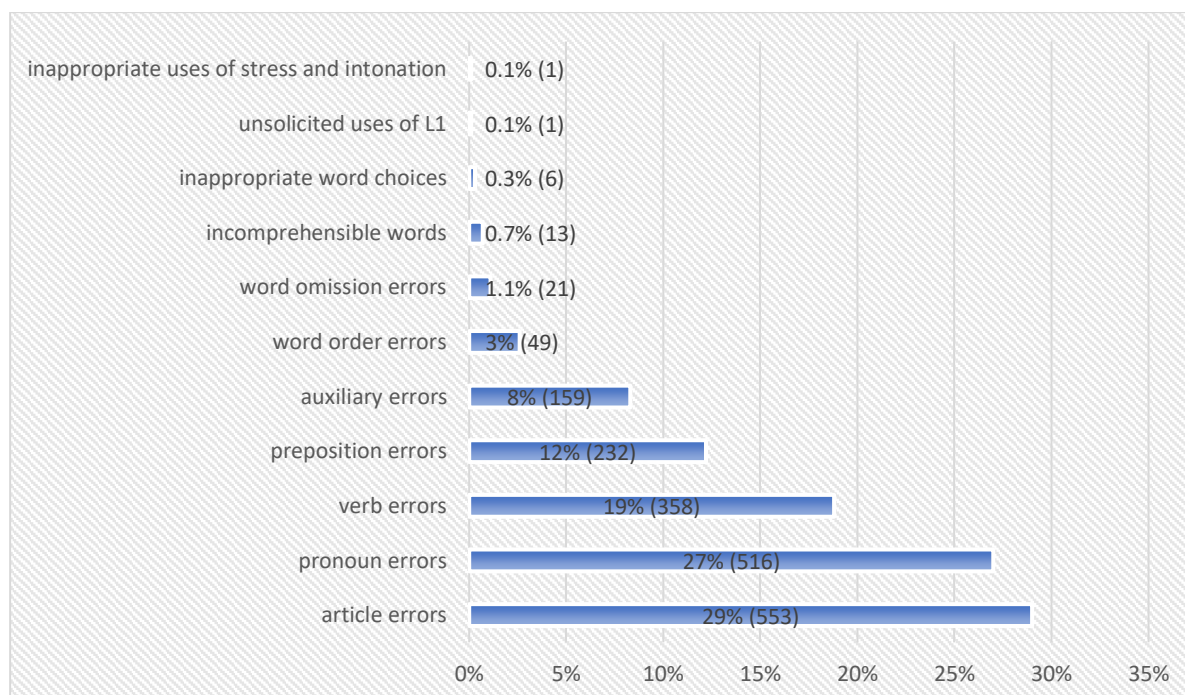

Figure 13. Types of errors

5.2 Grades in the assessment activities in the course

At the end of each of the four units, the learners must record a podcast and take part in an interview with the instructor in the middle and at the end of the course. These podcasts and online interviews are the assessment activities of the course as explained in table 11. To assess the learners' performance in those activities, the teacher evaluates the following aspects of the spoken language: range, accuracy, fluency, interaction (only for the online interviews) and coherence using the descriptors from A2 and B1 levels of the CEFR. The teacher assigns the learners a grade from 0.0 to 5.0, 3.0 being the passing grade according to the descriptor that best represents the student's performance in the activity. For the purpose of this investigation, only the grades given for language accuracy will be taken into consideration.

An analysis of the grades that the teacher assigned to the different assessment activities along the course shows that in the first podcast (unit 1), the grades were lower than the average (M=4.0, SD=1.6), they increased for the second podcast (unit 2) and the third podcasts (unit 3) and they were higher than the average in the last podcast (unit 4). However, the assessment for the first online interview, which took place in the middle of the course and the final interview, at the end of the course, shows a slight decrease as the results from the middle online interview are higher than the results from the final online interview. The analysis of the evaluation of the learners' performance in the assessment activities from the course shows that there is an improvement, despite the slightly decreasing tendency in the online interviews. This finding suggests that learners' accuracy levels improved along the course. Table 18 shows the grades the teacher assigned in the assessment activities in the course.

Table 18. Grades the teacher assigned in the assessment activities in the course

STUDENT	PODCAST 1	PODCAST 2	PODCAST 3	PODCAST 4	ONLINE INTERVIEW 1	ONLINE INTERVIEW 2	Mean	SD
S1	3.5	4	4	3,9	3.8	3,9	3.8	0.2
S2	3.5	4	4	4.2	4	3,9	3.9	0.3
S3	3.5	4	4	4.2	4.2	3,9	4.0	0.3
S4	3.5	4	4.3	4.2	4.2	3,9	4.0	0.3
S5	3	4	0	0	4.2	0	3.7	0.6
S6	0	4	0	0	0	0	4.0	N/A
Means	**3.4**	**4**	**4.1**	**4.2**	**4.1**	**3.9**	3.9	0.3

The descriptive data of clauses that contain errors in each unit show that the production of errors increase during the course, but drops in the last unit. Similarly, a look at learners' grades shows a steady increase and a very minor drop during the last assessment activity. However, the fact that students produce errors at a similar rate indicates that the development of the learners' oral accuracy is very similar for all of them. These findings suggest that learning a language online is not a linear process, but a process that has ups and downs. They also suggest that during synchronous learning activities learners produce mostly grammatical errors and article errors are more frequently found. Finally, these findings seem to suggest a moderate improvement in the participants' oral accuracy and they support the idea that language accuracy is a multifaceted construct, and it needs to be measured from different perspectives (Skehan, 2009) to have reliable results.

5.3 Synchronous learning activities, correction strategies and repair moves

This section seeks to describe quantitatively and qualitatively the correction strategies that the teacher employs to correct errors when interacting orally with students in the synchronous learning activities and the type of repair moves that these correction strategies generate. The correction strategies and the repair moves were identified employing Lyster & Ranta's (1997) error treatment sequence, which starts with identifying at least one error (E), the

reaction from the teacher to that error (CS) and finishes with the reaction from the learner to that correction (R). The error treatment sequence can be understood as (E+CS+R).

During the synchronous learning activities, the teacher provided corrective feedback and employed different correction strategies to fix the students' inaccuracies that emerge in the course of interaction. There were 246 clauses that contain correction strategies. The most common correction strategy was to explicitly provide the correct form when the teacher detects an error, which emerge in 61% of the cases. The next most employed correction strategies are recasts (22 %), followed by elicitations (2%) and metalinguistic cues (.08%). The teacher is not fond of providing a model of target-like input or of giving learners language clues about the error as elicitations and metalinguistic clues only appear on very few clauses in the synchronous learning activities. There is a big discrepancy between the clauses with errors (1909) and the clauses where there is a correction (246), suggesting that learners commit many errors, but the teacher only reacts to a few of them. The teacher may be following the strategy of focusing only both in correcting the mistakes appropriate for the proficiency level of the students and in mistakes that are related to the vocabulary and structures targeted by the course. Interestingly, the most common mistakes corrected by the teacher correspond to the most common error types: pronoun errors (N= 54), followed by articles (N=50), and verb errors (N=41), which are errors associated with inaccurate uses of grammatical items. Table 19 shows the type of correction strategies that the teacher employs to correct errors.

Table 19. Type of correction strategies employed by the teacher

Correction strategies				
	N	**%**	Mean	SD
Explicit corrections	185	75.2		
Recasts	54	22.0		
Elicitations	5	2.0	70	58.2
Metalinguistic clues	2	0.8		
Total	**246**			
Clauses without correction	1663			
Total number of clauses analyzed	1909			

Regarding the learners' reaction to the teacher's correction during successful repairs, which are the ones that lead to correcting the error, Table 20 shows that learners mostly preferred to repeat the teacher's feedback (N= 74, 30.1%) and in fewer cases they incorporated the teacher's feedback in the immediate clause (N=14, 5.7%). Self-repairs, which would show that learning is taking place (Quan & Weisser, 2015), are not very frequent and could only be observed on very few occasions (N=11). Unsuccessful repairs, which are the ones that do not lead to correcting the error, were fairly uncommon and happened when learners answered yes/no (N=3, 1.2%) or hesitated (N=2, 0.8%) to provide an answer. No repairs, which are the repair moves that do not include any reference to the error or to the teacher's correction were the most common reaction to the teacher's corrections (N=122, 59.%). This indicates that teachers' corrections go mostly unnoticed. However, when an error is made salient and the learners notice it, they try to fix it by either repeating it or incorporating it in a following clause, and in that sense learners are successful in repairing mistakes that they notice.

Table 20. Types of repair moves

			%	Mean	SD
Successful repairs	Repetition from students	74	30.1		
	Incorporation of teacher's correction	14	5.7		
	Self-repairs	7	2.8	60	35.1
Unsuccessful repairs	Yes/no response	3	1.2		
	Hesitations	2	0.8		
No repairs	No repairs	122	59.3		
	Total	**246**			

Figure 14 shows the amount and type of repair moves on the part of the learners that each correction strategy triggers. Explicit correction trigger mostly no repairs, repetitions, incorporations of teachers' corrections, and yes/no responses. Recasts trigger no repairs and repetitions in roughly the same amount, and on very few occasions incorporations of teachers' corrections, hesitations and yes/no answers. Elicitations trigger repetitions, one no repair and one incorporation of teachers' corrections, whereas the use of metalinguistic cues resulted in one yes/no answer and one no repair. The figure shows that the use of corrections strategies mostly triggered no repairs, suggesting that corrections from the teacher are mostly unnoticed. However, recasts seem to be more easily noticed as well as elicitation
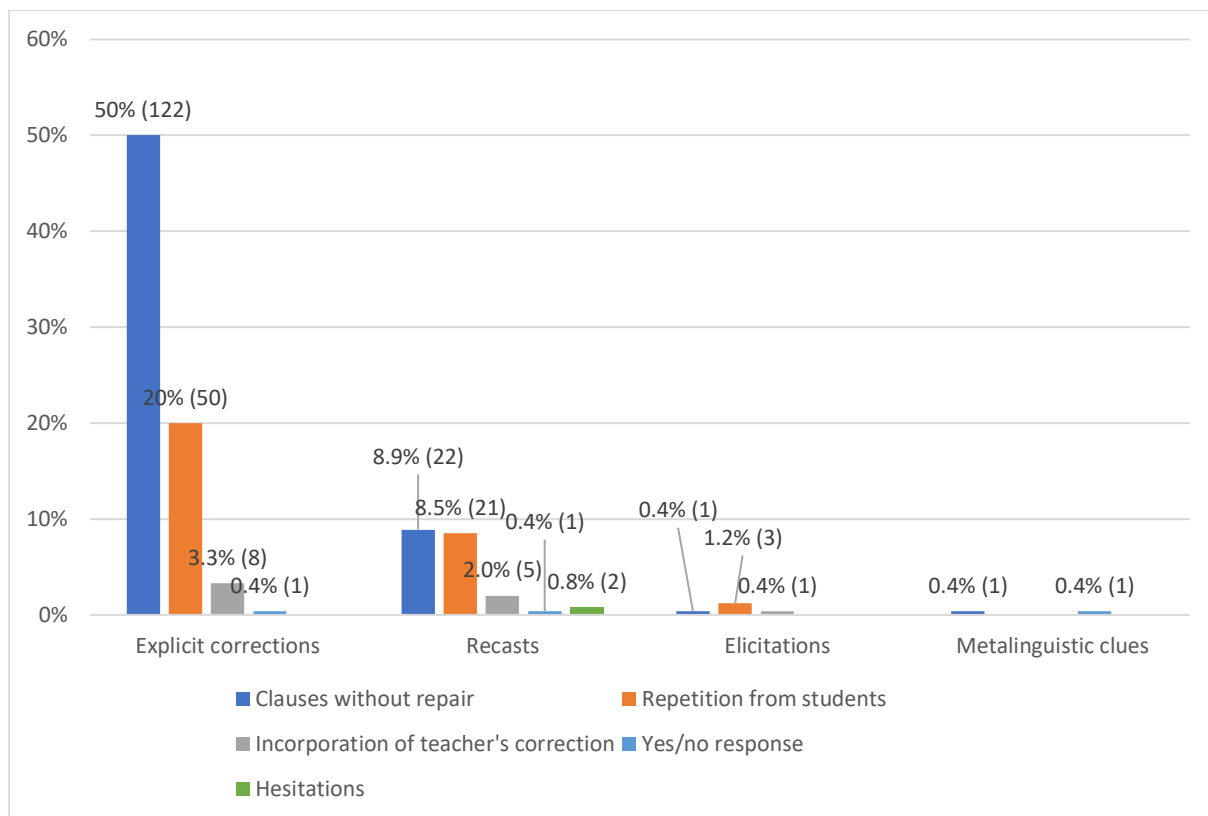
Figure 14. Repair moves triggered by correction strategies

5.3.1 Examples of error treatment sequences

This section illustrates with examples the error treatment sequences (E+CS+R) present in the data corpus whose main quantitative trends were presented in the previous section.

Explicit correction > repetition

This transcript comes from one of the synchronous learning activities in the third unit of the course. A student is speaking about a friend's fitness trainer and she is not sure about the type of pronoun to use, the teacher rephrases the sentence with a rising intonation to make the error salient, the learner reacts by incorporating the correct expression in the following clause.

E: he is a fitness trainer of hers

CS: he is her↑ fitness trainer

R: he is her fitness trainer (online lesson unit 3)

Explicit correction > no repair

This is an example of the use of correction strategies and the use of unsuccessful repairs, the learner is speaking trying to ask a question about a train schedule and has problems with the order of the words, the teacher reacts by stating the order of the words, but the learner reacts by ignoring the correction, carrying out with the conversation and making a new error.

> E: when does left the train?
>
> CS: wait! Remember, it is when + auxiliary + subject + verb. This is the structure
>
> R: ok, teacher, when we begin the activities? (online lesson unit 2)

Recast > no repair

As it has often been indicated in the literature, recasts tend to go unnoticed by the learners and their effectiveness in error treatment has been called into question because learners need training using them. In the following sequence we see an example of that. The teacher asks the student if he thinks Google employees are happy. The student answers and omits to use the personal pronoun, the teacher very subtly repeats the sentence correctly, but the student does not realize the correction and goes on with another topic.

> Teacher's prompt: do you think that the Google's employees are happy?
>
> E: depend, depend
>
> CS: it depends because as every work, I suppose that they have problems
>
> R: teacher, for me is delicious work (online lesson unit 3)

Elicitation > incorporation of teachers' correction

In another example, a student is describing an image and has problems finding the appropriate word, the teacher elicits the problem by providing several options, the learner reacts by repeating one of the options.

> E: …and the image two is complicate and very, very congest and *RUIDO* (noise)
>
> CS: do you mean complicated or complex or congested? Repeat the idea please.
>
> R: the image is very complicated (online lesson unit 1)

Metalinguistic clue > incorporation of teachers' correction

In this example, the learner makes an error when using the auxiliary *do* to make a negative sentence, the teacher spots the error and calls the learner's attention by asking her to think about the use of the auxiliary, the learner repairs her error by incorporating the correction in the next clause and this generates a new error.

> E: … teacher no, problem, no. I, I do not, not do possibility in this case.
>
> CS: wait, how do you say negative sentences in English? Remember the use of the auxiliary!
>
> R: I don't know the possibility to entering for Renata.(online lesson unit 4)

The findings from this investigation seem to suggest that the error treatment sequence (E+CS+R) is a very useful tool for identifying correction strategies and repair moves and for dealing with errors and using errors as a source for learning to take place. These findings suggest that there is a preference from the teacher to explicitly provide the correct form indicating the learner's utterance has an error and to reinforce the complete of part of the learners' utterance where there is an error. These findings show that although the majority of the corrections from the teacher are unnoticed by the learners, they still prefer to repeat the teacher's correction in a following clause and to incorporate the correction in the subsequent clause. These findings show that successful repair moves are more common than non-successful repair moves, which is evidence of the learners attempting to have control of the language structures and evidence of how the learners' interlanguages or their mental representations of the language stretch.

5.4 Learners' perceptions regarding their linguistic development and the teachers' correction strategies

This section presents the participants' perception and recollections in three parts. First, the perception of the errors that they think they produced in the synchronous learning activities.

Second, the participants' perception of the effects of the synchronous learning activities on the development of language accuracy and third on their teacher's use of correction strategies and their subsequent repair moves. The in-depth interviews and the focus group were carried out in Spanish because that is the participants' native language and they expressed their feelings, sensations, recollections, and opinions easily. Therefore, the quotes below are my own translation. As part of the analysis of the transcripts, open codes and axial codes helped categorize and synthesize the information and the themes that emerged, and they were identified as major categories and associated concepts. The results from that analysis are compared with the results from the analysis of the oral production in the synchronous learning activities, which appears previously in this thesis.

5.4.1 Perception of the production of errors in the synchronous learning activities

This section seeks to explore the participants' impressions and recollections of the production of errors in the synchronous learning activities. The analysis of the participants' impressions covers the participants opinion about the synchronous learning activities and the type of errors that they recall they produced in the synchronous learning activities.

As table 21 illustrates, the analysis of the recordings from the in-depth interviews and the focus group reveals that the participants in the online course report several effects of the synchronous learning activities. They view the synchronous learning activities as advantageous, as they feel that the synchronous learning activities stimulate interaction and provide instances for communicating authentically, as they replicate the type of interactions that take place in a classroom. For example, when asked to give an opinion about the topics explored in the online learning activities, this student explains that the topics are adequate, easy, and conducive to stretch his language repertoire.

"I think the topics in the online learning activities are adequate, they are not difficult, they are everyday topics such as healthy living and sports, besides the topics helped me learn new vocabulary and some grammar structures". (In-depth interview with student)

The participants in the course think that they produced several types of errors in synchronous learning activities. For example, the following student reflects upon the type of errors she makes and she identifies pronunciation inaccuracies, grammar difficulties, and she goes deeper into identifying the basic sentence structure as problematic.

"I am sure I made a lot of errors. For example, I know I have problems with pronunciation or grammar and the subject, verb, complement structure during the online lessons". (Focus group with students)

Another student identifies grammar aspects and specifically the use of verbs as problematic when asked about the errors that he thought he committed in the synchronous learning activities.

"I think the errors that I have made in the online lessons and sometimes in the online interviews have to do with grammar structures and more specifically the use of verbs". (In-depth interview with students)

Another student highlights that pronunciation problems are present in the synchronous learning activities employed in the online course and he provides an example of the kind of pronunciation inaccuracy he recalls. It is evident that he can identify that there are several ways to pronounce a word, in this case *learn* and he has developed a certain level of awareness as he notices that he can play with the tongue to produce different sounds.

"I know that I made many errors in the online lessons, the online interviews, the video forums and the podcasts. I had problems with grammar and pronunciation. For example, I had problems with the word *learn*, I said something like /lɜːn/ and sometimes I say

something like /lɛnd/ because I don't pronounce the /r/ sound. I think I make a bigger

effort in the /d/, I kind of place my tongue on the palate". (Focus group with students)

Participants believe they produced mostly grammatical errors in the synchronous

learning activities. A student points out that he had problems with the use of pronouns.

Although this student cannot identify precisely the type of pronouns he has trouble with, he can

infer that he has to use a different pronoun depending on the person he is talking about.

"During the online lessons, I made a lot of grammatical errors. For example, I started a

sentence talking about student 1 or student 3 and I ended up talking about me as the

subject of the sentence". (Focus group with students)

Another student notes how the synchronous learning activities promote learning new

structures as he identifies the need to master more complex language structures.

"I have always had an interest for linguistic topics and the online lessons have helped

me realize the need for complex structures. For example, the other day, I was wondering

how to build a sentence in past perfect progressive". (Focus group with students)

Table 21. Major categories of the effects of synchronous online learning activities

Categories	Associated concepts
Positive effects of the online learning activities	They stimulate interaction, opportunities to use the language authentically, they provide appropriate topics that are conducive to stretch their language, they foster natural language production that leads to the production of errors, consciously produce sounds and grammar structures, develop the need to use more complex structures and words
Error production in synchronous learning activities	Grammatical errors Sentence structure, use of verbs, use of pronouns, use of the third person singular Pronunciation errors Inaccurate pronunciation of vowel and consonant sounds

When contrasting the perception of error production in the synchronous learning activities in this study with the results from the analysis of the oral performances, we can see that there are several issues that can be discussed. First, the participants in the online course report that the synchronous learning activities are conducive to error production. Indeed, the results from the analysis of the oral performances shows that the synchronous learning activities are prone to error correction because errors are abundant when compared with the correction of errors and the errors that are repaired. Similar to the analysis of the oral performances that show that grammatical and lexical errors are more frequent, grammatical errors are more frequently perceived, specifically problems with the construction of sentences, the use of pronouns and verbs and the subject-verb agreement. It is worth noting however, that pronouns and verbs are two of the top three errors that the teacher corrects.

5.4.2 Perception of the development of language accuracy in the synchronous learning activities

This section details the participants' perceptions about the development of their oral language accuracy along the course. During the in-depth interviews with the students and the teacher and the focus group to students, there was a section in which the participants were asked to compare their performance in the synchronous learning activities at the beginning of the course and at the end. The participants were asked to compare aspects such as the development of language skills and the possible gains for their language skills.

When asked to compare their performance in English at the beginning and at the end of the online course and to think about their gains, participants noted that synchronous learning activities help them develop self-confidence to speak. This is evident in this opinion from one of the students who claims that she can be understood a bit more during conversations in English and she does not pay a lot of attention to the errors that she makes.

"The use of the synchronous learning activities in the course has helped me a lot because at least I can make myself clear. I can talk to someone for ten, five, or three minutes even if I make mistakes". (In-depth interview with student)

Another student points out that because of the topics explored in the course and the synchronous learning activities employed, she feels that she can place the appropriate words in the appropriate place in a sentence. She also feels more confident to talk about topics she is familiar with.

"Now that the course is finished, I feel that I can use the appropriate words in the appropriate place depending on the context and if the topic is familiar, I feel more confident and the participation in the online lessons, the podcasts, and the video forums has helped me a lot". (In-depth interview with students)

When asked about how the synchronous learning activities help the development of language accuracy, the teacher points out that at the end of the course the grammar problems were not as common as they were at the beginning of the online lessons, confirming what the students perceived about the development of language accuracy.

"Pronunciation was a problem at the beginning, but I don't think it was very relevant. They [students] presented many problems with grammar structures at the beginning, but at the end they were not very common in the online lessons". (In-depth interview with the teacher)

When participants were asked if their command of English improved, when comparing the performances at the beginning and at the end of the course, the students point out that the synchronous learning activities provided them with practice and are a key element in language development.

"The components of the course (synchronous learning activities) allowed me to speak a lot and when I compare the first unit and the last unit, I can see a big difference". (Focus group with students)

The opinions and the perception of the development of accuracy from the in-depth interviews and the focus group provide positive elements about the development of language accuracy throughout the course. One of the students points out that the synchronous learning activities help him master some grammar aspects.

"The online lessons helped me develop certain grammar aspects and I realized this when I compared my first and last online lessons". (Focus group with students)

Table 22 outlines how the participants in the course think their language accuracy develops as a result of the use of the online learning activities.

Table 22. Effects of online learning activities on the development of language accuracy

Major categories	Associated concepts
Gains	Development of self-confidence to speak, less intimidated by error production
Synchronous learning activities	Improvement in lexical, grammatical and phonetic accuracy

When comparing the development of language accuracy according to the analysis of the oral performances in the synchronous learning activities, with the participants' perceptions of how they believe their language accuracy develops, there are some issues that help us go deeper into understanding the development of oral language accuracy in synchronous learning activities. For example, if we look into the participants' grades and if we look into the production of errors along the course and the production of errors per student, we can see that there is an improvement in the accuracy levels along the course. Similarly, the participants in the online course perceive that they improved their ability to produce sentences with an

appropriate grammatical structure. Additionally, the participants feel that they improve their ability to place words accurately in sentences, they also feel that their pronunciation improves when they compare their performances at the beginning and at the end of the course. More importantly and impossible to detect from the analysis of oral performances, the participants feel they improve in aspects that go beyond the linguistic realm, such as the confidence to speak English regardless of the errors they commit and they acknowledge that the use of the synchronous learning activities translates into opportunities to use the language, which help in the development of their oral language accuracy. Interestingly, the perception that the synchronous learning activities contribute to the development of oral language accuracy was shared by both learners and the teacher, which suggests that synchronous learning activities are a feasible language learning possibility.

5.4.3 Utilization of correction strategies and repair moves

This analysis centers on the perception the participants had about how their teacher corrected their errors and how they reacted to those correction strategies. In other words, this analysis focuses on the use of correction strategies and the repair moves that those corrections generate. This analysis also concentrates on their perception about the process that the participants followed to correct their inaccuracies, their responses when they noticed an error, and how they reacted to their teacher's correction strategies.

In general, the participants in the course considered that their teacher's correction strategies facilitated the development of their language accuracy. They felt that their teacher's corrections helped them notice their errors and overcome pronunciation and grammar errors. For example, when asked to identify their teacher's correction strategies and her reaction, this student explained that the corrections helped her overcome grammar problems and that when the

teacher corrected her language production in English, she proceeded to write down the error and the correction and she kept a notebook with the corrections and the errors.

"I think that when the teacher corrected an error, it helped me with grammar problems, although the course isn't focused on that. And when the teacher corrected one of my errors, I wrote down the error and the correction in a notebook that I had". (Focus group with students)

A deeper analysis of the perceptions the teacher had helps us validate the students' opinion about the use of correction strategies and the use of repair moves in the synchronous learning activities. When asked the benefits of using the synchronous learning activities to correct errors, the teacher explained that she employed the synchronous learning activities to correct inaccuracies that appeared in other activities in the course, by using explicit corrections. This suggests that the online lessons not only serve to immediately provide feedback on the inaccuracies that appear during interaction, but also to correct inaccuracies that take place during other online learning activities in the course.

"When there were errors that I identified in the recordings [podcasts, audio or video forums] I provided a general feedback, I outlined them and provided the exact correction in the next online lesson". (In-depth interview with the teacher)

When asked about the type of errors that were corrected and the type of correction strategies employed, the teacher explained that she provided the explicit correction when she spotted grammar and pronunciation problems in the online lessons. The teacher also highlighted that she had students repeat her corrections in order to help them notice the error and the way to correct it and to engage them in a process of repairing the errors, which is similar to the error treatment sequence.

"In the online lessons, if they [the students] made a pronunciation or a grammatical error, I explicitly corrected them and I had them repeat the correction. If they [the

students] made the error again, I stopped and repeated the correction again and I had them repeat again until they got it right". (In-depth interview with the teacher)

Similarly, when asked to elicit the most frequently corrected errors in the synchronous learning activities and the most common strategies employed to correct them, vocabulary, grammar, and pronunciation errors were perceived as the most common errors and the provision of explicit corrections as the most common strategy employed by the teacher.

"The teacher always gives us the correct answer and she gets us to repeat when we make a mistake and errors with vocabulary, pronunciation, and grammar are the most common in the online lessons and online interviews, I think". (In-depth interview with students)

When asked to identify the use of correction strategies in the synchronous learning activities, the teacher points out that events and actions are unpredictable in synchronous learning activities, and although this entails a challenge, it also provides students with an opportunity to improve their command of the language. They have to repair inaccuracies with vocabulary, pronunciation, and grammar as soon as they occur. Similarly, the students identify the immediacy of the teacher to correct errors as soon as she detects one as an asset that helps them repair their inaccuracies. This is evident in these excerpts from an in-depth interview with the students, the focus group with students, and the in-depth interview with the teacher.

"What happens in the online lesson is unforeseeable and when I have to talk about unknown topics that causes me trouble and I make a lot of mistakes, but at the same time I have the chance to correct those mistakes as soon as they happen and broaden my knowledge of the language". (in-depth interview to students)

"[…] in the online lessons, they (learners) can talk in real time and they have to learn to solve their communication problems quickly by correcting the errors they make". (In-depth interview with the teacher)

"When we are speaking and we make a mistake the teacher corrects us at once […] I think that has helped me improve my vocabulary and correct problems with pronunciation and grammar". (Focus group with students)

The repetition of the teacher's correction is a frequent repair move that appears in the synchronous learning activities, a student explains that she repeats what the teacher says and it helps her improve her speaking skills in general and language accuracy in particular.

"[…] the conversations (online lessons and online interviews) were a very demanding activity and in these conversations, there was immediate correction of errors and when the teacher corrected me, I repeated what the teacher said trying to understand. It helped me a lot". (in-depth interview with students)

Correspondingly, the repetition of the teacher's correction is not a spontaneous reaction to a correction of an error; rather the teacher fosters it as an essential part of her teaching repertoire. She elicits the use of repetitions to correct pronunciation inaccuracies in the synchronous learning activities. This is evident in these segments from the in-depth interview with the teacher, where she explains that she pays attention to the errors the students produce; she corrects their errors, and has them repeat the correction because it is part of their learning process.

"[…] when I am teaching and I spot an error, I correct it and I have students repeat it because they are in a learning process". (In-depth interview with the teacher)

"When they [the students] mispronounced a word, I didn't interrupt them to correct them, what I did, instead, was to repeat the word or the sentence correctly. I did that not because I wanted to embarrass them, I did it as part of my speech, naturally, so they could notice where the error was". (In-depth interview with the teacher)

Table 23 outlines how the participants in the course perceive the effects of synchronous learning activities on the utilization and use of correction strategies and repair moves.

Table 23. Perception of the effects of synchronous learning activities on the utilization and use of correction strategies and repair moves

Major categories	Associated concepts
Positive effects of the utilization of correction strategies and the use of repair moves	Overcome pronunciation and grammatical inaccuracies, help notice errors
Use of the synchronous learning activities to correct errors	Retrieve errors from other online learning activities, make errors salient in the online lessons
Engagement in the process of repairing errors	Making errors salient to ensure noticing and correcting them
Types of errors corrected, types of correction strategies used and online learning activities that are prone to correct errors	Vocabulary, grammar and pronunciation errors, explicit correction of errors, online lessons are adequate for error correction
Assets of the synchronous learning activities to correct errors	Immediacy to identify and correct errors
Repetition of the correction from the teacher	Helps to understand and improve linguistic aspects, helps to notice and correct errors

A comparison of the results from the analysis of the oral performances in synchronous learning activities shows that explicit corrections are the preferred type of correction strategies. This analysis shows that the preferred repair move is the repetition of the teacher's correction and the utilization of correction strategies almost always lead to successful repair moves. Similarly, explicit corrections are viewed as an effective strategy to correct errors, synchronous learning activities are viewed as online learning activities that facilitate the noticing and correcting of inaccuracies and repeating the correction by the teacher is perceived as an effective way to repair errors. These results seem to confirm what the analysis of the oral performances show: that teacher intentionally engage learners in the error treatment sequence seeking to have students realize their errors and repair them.

The analysis of the opinions and perceptions of the participants allows us to dig deeper into aspects that are not accessible by only analyzing the oral performances in synchronous learning activities, but which are worth mentioning, to better understand the use of correction strategies and repair moves and their relationship with the development of language accuracy. For example, the students explain that one of the assets of synchronous learning activities is the immediacy of making an error salient, which together with the uncertainty of events and the incapability to prepare and anticipate errors, appears to enhance the development of their command of the language. The analysis of the oral performances in the online learning activities shows that self-repairs seldom appear. Similarly, the analysis of the perceptions of the participants shows that references to self-repairs do not take place, which suggests that the students are not aware of them and self-repairs are not promoted in the synchronous learning activities.

5.5 Summary of the findings

The results from this study can be summarized as follows:

- Learners produced a higher proportion of grammatical inaccuracies, followed by lexical and phonetic errors. Article, pronoun and verb errors appear as the most common type of errors found in the learners speech during synchronous learning activities.

- Most learners produced mistakes at a similar rate and the number of mistakes they made dropped towards the end of the course.

- The development of oral language accuracy can be observed in the evolution of the grades that the teacher assigned to the assessment activities in the course.

- Most teacher's corrective feedback went unnoticed by the students, but when the students noticed the mistakes made salient by their teacher they successfully repaired them.

- Explicit corrections appear as the preferred type of correction strategy the teacher uses, while the repetition of the teacher's correction is the most common reaction of learners to fix the inaccuracies they manage to notice.

- The most common mistakes the teacher corrected (pronoun errors, articles, verb) correspond to the most common types of mistakes learners made (inaccurate uses of grammatical items).

Additionally, the analysis of the in-depth interviews and the focus group confirm and complement the findings above:

- The participants in the course perceive that that they have problems with sentence construction, the use of pronouns and the use of verbs. When comparing their performances at the beginning and at the end of the course, they report an improvement on word order, pronunciation and grammatical aspects of the language.

- The participants valued the unpredictable nature of the synchronous learning activities, which fosters the ability to repair errors as soon as they happen to continue with interaction and report having gained the ability to recognize and repair errors, and self-confidence to speak in English.

- The participants confirmed that the teacher's corrections helped them overcome pronunciation and grammatical errors.

- By using mostly explicit corrective feedback, the teacher reports to intentionally engage learners in the error treatment sequence by identifying errors and making them salient with the ultimate purpose of having learners correct their inaccuracies.

6. Discussion

This section analyzes and evaluates the findings presented in the above section. It systematically discusses, summarizes and interprets the main results in order to provide

answers, explanations and interpretations to the research questions. The discussion of the results of this investigation are presented in two sections. The first section discusses the production of errors and the development of the participant's oral language accuracy in the synchronous learning activities. The second section discusses the type of correction strategies that the teacher utilizes to correct errors when interacting orally with students and the type of repair moves that those correction strategies generate. This discussion is accompanied by explanations and references to conclusions and findings from other studies that have explored the production of errors, the development of language accuracy, the use of corrective feedback and subsequent repair moves on the part of the learners.

6.1 Synchronous learning activities and errors

The results from this investigation show that the synchronous learning activities in the course are conducive to error production. These results also show that grammar errors are more frequent and problems with the accurate production of articles are more likely to appear. These results suggest that errors appear in synchronous learning activities because they offer many opportunities for interaction between the teacher and students and among students, which generate opportunities to produce errors. These results show that the synchronous learning activities also entail a short time to think and answer the teacher's questions and limited opportunities to monitor learner's language production and anticipate errors. The results of this investigation show that those characteristics stimulate the production of errors and facilitate the development of language accuracy. These results are in accordance with other studies that have found that teacher-student interaction, which takes place in the synchronous learning activities, generates a need to be able to understand the messages, and a need to plan a reply in the shortest interval of time, they offer learners opportunities to communicate authentically, little time to prepare a response, and pay more attention to convey meaning (Razagifard, 2013). Other studies have also found that when interacting orally in tasks mediated by synchronous modes of

communication, the participants pay more attention to getting the meaning across than to the formal aspects of their message, which translates in a high number of errors (Bueno-Alastuey, 2010; MacDonald et al., 2013). Additionally, these results are in good agreement with other research that shows that synchronous learning activities drive the production of errors because students feel more engaged in the online experience and the participants feel a connection to peers and instructors (Watts, 2016). Another explanation of the reasons why errors are likely to occur in synchronous learning activities is the context where the interaction happens. The interaction in the synchronous learning activities, in my study, was among non-native speakers of English, who shared the same L1 (Spanish), which produced a reduction of anxiety levels and thus a lowering of the affective filter just as Satar & Özdener (2008) claim, when the affective filter is low, learners feel less threatened about error production, they speak freely, which at the end facilitates learning (Bueno-Alastuey, 2010).

The results of this investigation show that the synchronous learning activities facilitate the development of language accuracy, judging from the grades in the assessment activities in the online course and the participants' performance along the four units of the course. Other studies have shown that synchronous learning activities help the development of oral language accuracy. For example, Hirotani (2009) investigated the effects of tasks mediated by synchronous or asynchronous tools on the development of linguistic features of learners' speech. In her investigation, to measure the development of accuracy, she used measures such as linguistic complexity, language production and cohesive devices. The study showed that there were significant gains in the measures analyzed, which indicates that overall, the participants significantly improved their oral proficiency skills over the course of a semester. Hirotani's (2009) explanation of her findings can help understand the results of my investigation. She claims that the use of synchronous learning activities help develop oral skills because first, there is a relationship of assistance between the synchronous learning activities

and other resources in the online course. Second, the learners' attention when performing in the synchronous learning activities focuses on the form when necessary, engaging learners in a purposeful interaction or engaging the participants in the error treatment sequence. Third, the level of difficulty of the synchronous learning activities fits the level of proficiency of the learners. Fourth, there is an appropriate degree of association with the interests of the learners, therefore, the participants report positive effects on their language learning process.

Participants' perceptions and reflections about their performance in the synchronous learning activities in the present study point to the development of other skills that go beyond the linguistic realm. For example, the development of language awareness, the ability to identify different types of errors that the participants produce and the development of self-confidence to speak English. These results are similar to those from Yilmaz' (2011) who found that the development of language awareness and the development of self-confidence to speak English in online learning activities are the result of the production of large amounts of target language output that can lead to reflect on their own output and that of their partner's.

To sum up, the results of the present investigation suggest that an analysis of learners' and teacher interactions during synchronous online learning activities helps us observe and illustrate the production of errors and the development of oral language accuracy.

6.2 Synchronous learning activities, correction strategies and repair moves

As it was stated previously in this thesis, the use of correction strategies takes place in the synchronous learning activities because they facilitate interaction between the teacher and the students or between learners. The results from the present study show that the teacher mostly prefers to use explicit corrections and recasts. Fiori's (2005) also found a high amount of explicit corrections revolving mostly around vocabulary inaccuracies, whereas in the present study there were mostly regarding grammatical inaccuracies. A possible explanation for the extensive use of explicit corrections found in the present study is that the teacher felt the need to call

direct attention to the nontarget-like utterances which seemed to mostly go unnoticed by their students. According to Fiori (2005), providing explicit correction to an error generates opportunities to pay attention to the error, to comprehend its nature, and there are more chances to correct it. Sarandi (2016) provides an explanation as to why the use of explicit corrections outperformed the use of other correction strategies in this study. He suggest that the extensive use of explicit corrections is rooted in the low linguistic level of the participants in the course, who needed more explanations and whose limited resources did not allow them to process less explicit types of feedback, such as recasts which tended to go unnoticed. The present study provides additional evidence of recasts going unnoticed, but it contests the efficiency of explicit corrective feedback in fostering learner uptake. Contrary to other study's findings which indicate that the use of corrective feedback leads to more uptake than other feedback types (recasts, for instance), it seems that the teacher's tendency to use explicit corrective feedback could be largely motivated by the inability of the students to notice the mistake and thus initiate repairs.

The production of correction strategies was low when compared with the production of errors, as the results from this investigation show, which seems to indicate that the teacher only reacts to a limited number of errors. These results are in good agreement with a study carried out by Monteiro (2014) that shows that the participants who took part in activities embedded in a videoconference tool produced a higher number of instances containing incorrect target forms when compared with the instances providing feedback. The teacher may also have been choosing to exclusively correct mistakes which the students could comprehend and attend to given their proficiency level or mistakes closely related to the language points covered during the online course.

The findings from the students perceptions revealed that the students believe the use of correction strategies helps them improve their understanding of grammar aspects, to build

vocabulary, and to master pronunciation features, in tune with Monteiro (2014), Sauro (2009), Sagarra & Abbuhl (2013), and Sheen (2006). The use of explicit corrective feedback was regarded by the students as a convenient way of receiving feedback in online synchronous environments. The participants in this investigation highlighted that the use of corrective feedback helped them repair pronunciation problems and facilitated the identification of errors. This is in accordance with Kartchava & Ammar's (2014) findings which indicate that students who were treated with corrective feedback were able to notice the target grammatical structure significantly more and their levels of learning the target grammatical structure were also higher.

Based on how the teacher use of the error treatment sequence, the results from this investigation suggest that the production of errors in synchronous learning activities, the correction strategies that the teacher utilizes and the repair moves that those strategies generate can be seen as a loop in which the performance in synchronous learning activities generate oral interactions between the teacher and the students, which generate errors that appear because of the increase in the opportunities to use the language, the promotion of interaction and the immediacy to respond to continue with interaction. These errors generate a reaction from the teacher who mostly uses explicit corrections and those correction strategies produce a reaction from the learners who mostly repeat the correction from the teacher. Finally, the production of errors, the use of correction strategies and the use of repair moves in the synchronous learning activities result in the control of certain language features and the cycle starts again with new errors (see figure 15). This suggests that teachers have a number of tasks to perform. They must support students by providing a structure of the learning content, they have to stimulate students' motivation and provide feedback of accomplishment (Paechter & Maier, 2010). Students, on the other hand, have to provide immediate responses with limited resources (AbuSeileek & Qatawneh, 2013).
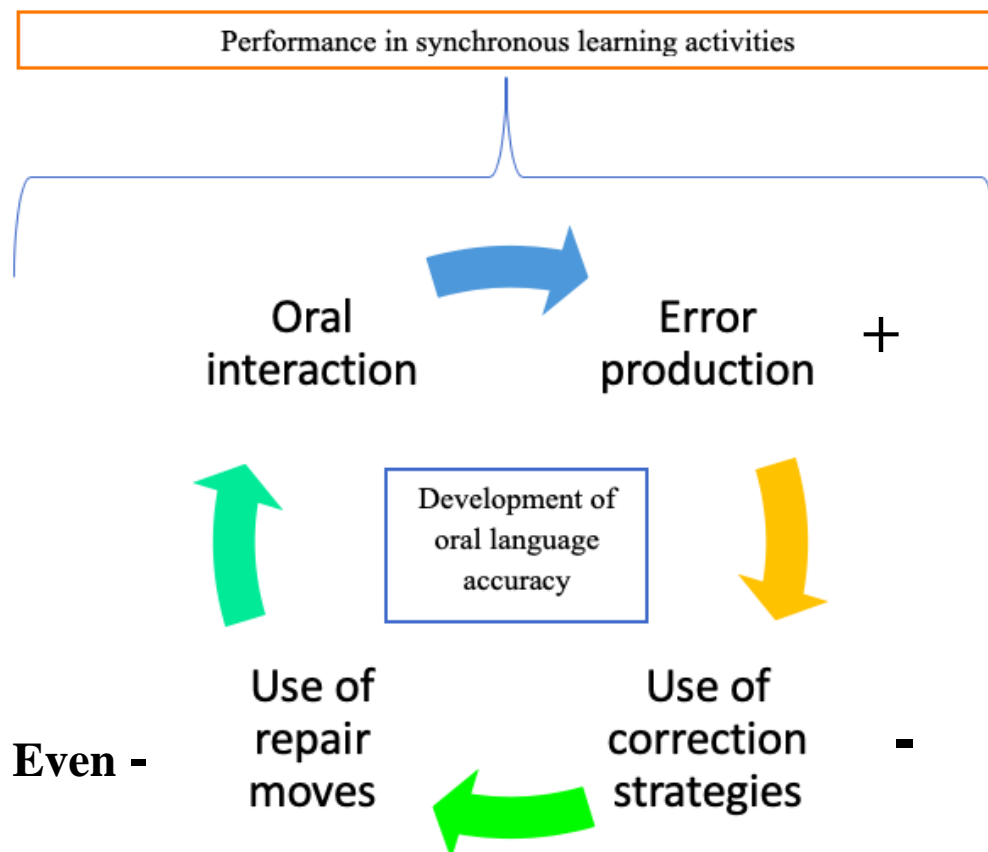
Figure 15. Error production, correction strategy use and repair move selection seen as a loop

To sum up, the results of this investigation indicate that the preferred strategy that the teacher used to correct learners' inaccuracies in the online course were explicitly providing the correction to errors probably as a response adjusted to the linguistic level of students. Most teacher's corrective feedback was not salient enough and did not facilitate learner uptake given that it failed to triggered repair moves on the part of the students. When feedback was noticed however, it was successfully repaired in most cases by repeating the teacher's corrections. Repeating the correction was an attempt of the learners to internalize the new structure or language feature, and as a consequence, as Heift (2010) points out, their performance can improve on that particular target language feature because their language awareness is raised.

6.3 Summary

In this section, the results from the present investigation were summarized, evaluated, and interpreted with respect to the research questions in two sections and each section sought to answer one of the research questions. The first section discussed the role of synchronous oral learning activities on helping illustrate the evolution of language accuracy levels of the students throughout the course. The second section covered the correction strategies that the teacher utilized to correct errors when interacting orally with students and the type of repair moves that these correction strategies generated, including explanations and interpretation of the results.

7. Conclusions

This qualitative case study analyses the participants' oral productions in synchronous learning activities by observing the production of errors, identifying the correction strategies that the teacher employs and the repair moves that those correction strategies generate. In the previous section, the results from the present investigation were summarized, evaluated, and interpreted with respect to the research questions.

This section explores the conclusions from the study, it draws inferences, and theoretical and practical consequences by examining, interpreting and qualifying the results, and it includes the limitations of this study and suggestions for future studies. The conclusions are presented in the following segments; first, the number, type and evolution of the errors learners produced in the synchronous learning activities. After that, the development of language accuracy in the synchronous learning activities. The next section deals with the utilization of correction strategies and the selection of repair moves during synchronous learning activities, followed by an exploration of the practical consequences of this investigation for online language teachers and online course designers. At the end of this section, there are explanations of the limitations and strengths of this study and some suggestions for future research.

7.1 Synchronous learning activities and error production

From the results of the present investigation, we can conclude that the production of errors instead of being a barrier for the development language accuracy, it actually helps its development by enabling the learners to interact with their teachers in the error treatment sequences which provide them with negative evidence that mostly lead to successful repairs. These conclusions indicate that despite the need for the teacher and the students to meet at the same time, which can pose a limitation for the implementation of synchronous learning activities, their use produces opportunities to use the target language in situation that simulate authentic communication, focus on form and opportunities to provide and receive feedback. Online teachers and online course designers should implement strategies to incorporate synchronous activities when teaching English online. Although it is difficult to control the practice of specific language features in communicative situations as meaning prevails, a relation of interdependence between synchronous learning activities and other sections of the course such as asynchronous learning activities could result in more beneficial learning experiences for the learners.

7.2 Correction strategies and repair moves during synchronous learning activities

This investigation suggests that the extensive use of explicit corrections is the result of the teacher's need to make the errors salient and to adapt to linguistic level of students who seek clear answers that help them identify errors and make sense of the correction. The results from this investigation have shown that learner uptake is not guaranteed even after the teacher's use of explicit corrective feedback. In the cases were uptake is observed, it mostly leads to successful repairs where students repeat their teacher's correction. By repeating the correction from the teacher, the students attempt to automatize the development of their language accuracy by noticing their errors and trying to avoid committing them. A main conclusion from this study is that explicit corrections and recasts provide similar results, but none of them seem to be salient enough for students to notice in synchronous online lessons were there are interactions

between several learners and just one teacher. This suggests that in order to improve oral skills in online environments, teachers should use other means of signaling mistakes that help learners notice their errors. These could perhaps be facilitated by the use of multimodal artifacts where learners can be pointed to the mistakes, for instance in a written format in the chat or using the videoconference whiteboard feature. This would help the provision of additional explanations and visual aids which could reinforce the oral corrections provided by the teacher during interaction.

7.3 Practical consequences for EFL teachers in online environments

This study provides several contributions to the emerging field of language teaching in online environments. This investigation strongly highlights the need for online teachers and online course designers to develop strategies or techniques to maximize the effectiveness of online learning activities. This study strongly suggests the implementation of Communication-Oriented Language Teaching principles when delivering teaching activities synchronously or when designing online courses that have synchronous activities. Therefore, this investigation adds to the already identified needs to include pre-service and in-service teaching programs that help teachers realize the benefits of incorporating online synchronous learning activities (Compton, 2009). The topics explored in those pre-service and in-service programs can range from selecting the adequate tools to achieving a learning objective or strategies, principles of online course design, strategies for successful synchronous learning activities, and error treatment strategies in online settings.

7.4 Limitations and strengths of the study

Although this study was carried out carefully, it presented a number of limitations that affected the results. First, the study explored only one case; having more web-based groups or a face-to-face course to compare with the current one would have allowed to study the clauses

produced by other groups of students and the correction strategies employed by other teachers. Second, the number of participants in the course was difficult to control because it depended on the number of people interested in the course for the semester, when it was offered. Two students dropped out along the course for different reasons that were out of control of the study and the students and data left constrained significantly the data analysis which could be performed.

Despite these limitations, the study has several strengths. First, the study identifies the more frequent errors in synchronous learning activities and it illustrates the evolution of language accuracy throughout the course and broadens the understanding of the possibilities of teaching languages in online settings. Second, it showed how the development of language accuracy was facilitated by the teacher's role in providing corrective feedback and stimulating noticing of errors and repair moves.

7.5 Suggestion for future research

This study shed light on our understanding of the development of language accuracy, aided by the teacher's use of correction strategies in an online course. However, many other studies can be carried out to deepen the usefulness of learning activities mediated by synchronous communication tools in the teaching and learning of languages in web-based environments. For example, a longitudinal study in which error production, corrective feedback and learner uptake in synchronous learning activities can be studied over time. More research is required to determine how the production of problematic target structures or sounds can be elicited in synchronous learning activities. More broadly, research is also needed to understand the production of repair moves triggered by certain correction strategies. It would be also interesting to carry out comparative studies on learners' oral performances in synchronous, asynchronous activities and in traditional, face-to-face environments and in different types of computer-mediated communication.

7.6 Brief Summary of the research

This investigation was a qualitative case study with a mixed-methods and a Computer-mediated Discourse Analysis (CMDA) approach that employed quantitative and qualitative research methods to analyze data. It sought to explore the development of learners' oral language accuracy by examining the production of errors and their corrective treatment on the part of the teacher in online synchronous learning activities. Specifically, it sought to identify the correction strategies that the teacher used and the repair moves that these strategies generated. To explore those issues, this study employed the clause as a basic unit of analysis. The sources of data for this investigation were the oral performances in synchronous learning activities, the participation in in-depth interviews and a focus group and the grades from the assessment activities in the online course.

The main results of this investigation showed that most learners produced mistakes at a similar rate and the number of mistakes they made dropped towards the end of the course, something which is also reflected in the language accuracy marks their teacher gave. Synchronous learning activities provided instances to correct errors as soon as they appeared as well as social instances to communicate with the teacher and peers. The teacher preferred to use explicit corrections in an attempt to make errors clear and the students, when they noticed them, mostly reacted by repeating that correction, suggesting an involuntary engagement in an error treatment sequence. The results from this investigation showed that the participants developed abilities other than linguistic, for example, a certain level of language awareness, the ability to self-diagnose errors, and the development of self-confidence to speak.

This study had some limitations such as the exploration of only one case, the number of participants in the course, and the length of the online course. However, this study had several affordances. The study presented an exploration of the learners' oral performances in synchronous learning activities, including interactions with their teacher where feedback was

received and responded to, accompanied by an analysis of the insights of the participants on their performances and the development of their oral accuracy.

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Appendices

Appendix 1
Consent form used at the beginning of the study
Activity: Effects of the synchronous learning activities on language accuracy, correction strategies and repair moves.

Activity coordinator:
Contact information:

Dear student,

This investigation is part of the doctoral studies of professor Jorge Pineda. You have been invited to participate in this study because you are a student in one of the courses offered by the School of Languages.

Below, you will find the purpose of the activity and we will answer some questions that we know will interest you.

WHAT IS THE PURPOSE OF THE STUDY?
The purpose of this study is to collect data to identify the effects of synchronous learning activities on the development of language accuracy, the utilization of correction strategies, and the selection of repair moves.

HOW LONG WILL THE STUDY BE?
The study will last for about six months.

WHAT BENEFITS DO THE PARTICIPANTS HAVE?
The participants will not obtain any economical or academic benefit.

HOW WILL THE CONFIDENTIALITY OF THE PARTICIPANTS BE KEPT?
The names or images of the participants will not be used in the research reports, articles, or any other production. There will be mention of only group characteristics and the participants will be identified as S1, S2, S3, and so on.

WHAT DOES PARTICIPATION IN THE STUDY IMPLY?
The participation in the study is voluntary. The participants can withdraw from the study at any moment without any consequence. The participants can have access to the information gathered upon request.

I accept to take part in this investigation:

Name: _____ Signature: _____

I do not accept to take part in this investigation:

Name: _____ Signature: _____

Appendix 2
Protocol employed in the in-depth interviews and the focus group to students

**Effects of synchronous and asynchronous learning activities on language accuracy,
correction strategies, and repair moves**

Dynamics of the session
- Setting up the interview
- Explain the purpose of the interview
- Explain that the interview will be audio recorded
- Explain that the identity of the respondents will be confidential
- Explain that the audio will be transcribed for analysis purposes
- Present the consent form

Interview guide
General probes
- What is your opinion on online lessons, online interviews, audio forums, video forums, and podcasts in the course?
- What is your opinion on the way your teacher corrected your mistakes?
- Do you remember your reactions to the teacher's corrections? Could you explain them to me?

Specific probes

Type of errors   Try to remember the types of mistakes you made in the online lessons and online interviews. Try to think about problems in the way you built sentences, the difficulties you had to find a word, and the difficulties you had to pronounce words.   **Correction strategies**   Try to remember the way your teacher corrected the errors you made in online lessons and online interviews. Try to remember also the manner in which your teacher reacted when you made an error and how your teacher made sure you corrected the error.   **Repair moves**   Finally, try to remember your reaction when the teacher corrected an error that you made. Try to remember what you did when you realized that you had made an error.   **Development of accuracy**   Can you compare your performance in the online lessons and online interviews at the beginning and at the end of the course? Do you think there is a difference between the number of errors that you made at the beginning and at the end of the course?

Appendix 3
Protocol used in the in-depth interview to the teacher

Effects of learning activities on language accuracy, correction strategies, and repair moves

Dynamics of the session
- Setting up the interview
- Explain the purpose of the interview
- Explain that the interview will be audio recorded
- Explain that the identity of the respondents will be confidential
- Explain that the audio will be transcribed for analysis purposes
- Present the consent form.

Interview guide
General probes
- What is your opinion of online lessons, online interviews, audio forums, video forums, and the podcasts in the course?
- What is your opinion on the manner in which you corrected your students' errors?
- How did your students react to your corrections?

Specific probes

Type of errors

Carefully describe the type of errors that your students made in online lessons, online interviews, audio forums, video forums, and podcasts. Think about problems with the way your students built sentences, the type of words they used (where they placed them or difficulties finding the appropriate word) and the manner in which they pronounced words (difficulties with the pronunciation of specific sounds)

Correction strategies

Carefully describe the way you reacted when your students made an error. Think about the way you made sure your students realized an error (the type of behavior such as repeating your students' error, providing the correct answer, etc.)

Repair moves

Carefully describe your students' reaction to your correction. Think about how your students corrected their errors.

Development of accuracy

Carefully describe how your students' ability to speak English has changed when you compare their performance at the beginning and at the end of the course. Think about the number of errors they made in the first and the last podcasts, the first and the last audio or video forums, or the first and the last online lesson.

Appendix 4
Matrix employed to collect the quantitative data from the oral performances in synchronous and asynchronous learning activities

clause	participant	type of task	convey	Unit	ARTI GR ER	PRON GR ER	VER GR ERR	PREPO GR E	AUX GRA E	WoO GR ER	WoOM GR E	IN CHOI L	PRE SUF I	V C PH E	AD OMI P	NO LINK	STR INTO	NoCOMPR	U u L1	E C	R	E	M I C	C R	R	STU REPE	INCOR TS	SEL E REP	YES NO R	HESIT REP	SAME MIS	PART REA	EXPERIME
1	3	2	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	3	2	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	3	2	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0