



Pontificia Universidad
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TOPIC:

**VOICE RECORDING APPLICATIONS FOR THE DEVELOPMENT OF L2
SPEAKING FLUENCY**

**Research project prior to obtaining the Master's degree in English Pedagogy
as a Foreign Language**

Line of research:

Innovative Pedagogies

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Ambato – Ecuador

October 2022

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ACKNOWLEDGMENT

This thesis is the result of the effort and perseverance of those who were part of this long path of professional training.

For this reason, I would like to thank Mg. Serge Bibauw was a key part of the preparation and guidance of this work.

As well, I would like to appreciate my parents who during the course of my life have supported and motivated my academic training, believing in me at all times.

Thank you for all patience of my teachers. Finally, thanks to this prestigious university, who opens its doors to young people like us, preparing us for a competitive future and forming us as good professionals.

DEDICATION

This dissertation is dedicated to God for having allowed me to teach this point and achieve this great goal in my life, to bless me with health, intelligence, and kindness. I dedicate my thesis to my father, who is an example of love and perseverance, as well to my mother, who has always helped me unconditionally, and my brother Kevin giving his love and hand.

RESUMEN

Las aplicaciones de grabación de voz se han convertido en herramientas pedagógicas digitales que han contribuido al desarrollo significativo del idioma para mejorar la fluidez y habilidades lingüísticas de estudiantes. En la actualidad, metodologías utilizadas para hablar el idioma no satisfacen las expectativas del profesor, como el interés del alumno por mejorar. Por lo tanto, es imperativo encontrar soluciones que hagan viables este problema. Por esta razón, en esta investigación, el objetivo fue implementar aplicaciones de grabación de voz como metodología aplicable para el desarrollo de la fluidez oral en L2, apoyándose en un enfoque cuantitativo y diseño cuasi-experimental los investigadores trabajaron con grupos de clase, uno experimental y de control. El grupo experimental fue tratado con ocho planes de clase con el uso de aplicaciones de grabación de voz mientras que el grupo de control trabajó con la planificación tradicional, fueron evaluados con un instrumento de habla como pre y post test. Los resultados de la investigación mostraron que métricas de fluidez, tasa de habla y la tasa de articulación, en el grupo experimental aumentaron significativamente mientras que el grupo de control tuvo un aumento mínimo. Por lo tanto, se concluyó que el uso de aplicaciones de grabación genera buenos resultados en el desarrollo de la fluidez del habla en estudiantes. En el futuro, los profesores pueden utilizar este tipo de herramienta digital durante las horas de clase para producir una mejor comunicación en Inglés.

Palabras clave: Aplicaciones, fluidez, habla, L2, desarrollo.

ABSTRACT

Voice recording applications have become digital pedagogical tools that have contributed to the significant development of the language to improve the fluency and language skills of students. Nowadays, the methodologies used to speak the language do not satisfy the expectations of the teacher in class and the learner's interest in improving fluency. Therefore, it is imperative to find solutions that make these problems viable. For this reason, in this investigation, the objective was to implement voice recording applications as an applicable methodology for the development of L2 speaking fluency, this research was supported by a quantitative approach and quasi-experimental design in which the researchers worked with existing class groups, an experimental group, and a control group. The experimental group was treated with eight lesson plans with the use of voice recording applications while the control group worked with traditional planning, both groups were evaluated with a speaking test instrument as a pre-and post-test. The results of the research showed that the fluency metrics, speech rate and articulation rate, in the experimental group increased significantly while the controlled group had a minimal increase. Therefore, it was concluded that the use of voice recording applications could generate good results in the development of speech fluency in students. In the future, teachers can use this type of digital tool with students during class time to produce a better English communication.

Keywords: Applications, speaking fluency, L2, development.

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INTRODUCTION

Globally, having a good knowledge of the English language is becoming increasingly necessary, and interest in learning it continues to grow throughout Latin America. The importance of this language continues to grow day by day as more and more people want or need to communicate in English. There is no doubt that English is the language of choice in Latin America and is the most taught, read, and spoken language in the world today.

In this sense, the English language is present almost everywhere in the world. It is considered the principal communication element between very diverse cultures that share few or no similarities. The phenomenon of the English language is interesting because it can be related to a debate about its presence around the world, its reasons, and its consequences.

Its status as an international language has driven in recent decades the importance of its teaching when speaking fluently (Kachru & Nelson, 2001). Furthermore, English as a foreign language is at the top of primary and secondary education curricula in almost every country in the world but statistics show little awareness of teaching strategies for speaking fluently (Aikina & Zubkova, 2015).

On the other hand, in Ecuador, English was considered an optional subject; that is, each institution had the possibility of including it or not in its teaching curriculum. The number of class hours offered within the curriculum could be determined by each institution, however, this reality changed significantly in 2014, when the government was concerned with improving the channeling of foreign language learning.

In Ecuador, teaching English as a foreign language has taken new changes in its educational policies to adapt to the needs of a globalized world. Evidence of this is the National English Curriculum (2016), which speaks of the importance of exposing students to spoken English from an early age thanks, to this, there are better opportunities to study, travel, and achieve professional goals. Curriculum

emphasizes that spoken production and interaction are part of the Oral Communication Curriculum Strand, making it one of the most important aspects for students to learn (Eyisi, 2016).

During the last few years, Ecuador has tried to create a solid and favorable system for the teaching-learning process of a foreign language, specifically English. System that is inclusive, where all students have the opportunity to learn and become proficient in English as a communicative language. In this context, it becomes transcendental to socialize the proposed changes in the entire educational community through conferences and the generation of research spaces in the field of foreign languages, and the constant accompaniment of teachers who work in this area.

Although with the implementation of new methods for the development of English, students of all educational levels have a low level, due to the little attention given to the teaching of languages as a foreign language, the lack of strategies for the development of fluency and language skills of the teacher, are factors that must be corrected.

The situation in the Santo Domingo high school is that students produce English in all four skills, but teachers have a specific focus on written exercises and activities. There are few oral expression activities that are developed in the classroom due to the high number of students. The conversations are made in pairs or groups, and this has shown that this type of strategy does not allow a better development in the students' fluency. Another aspect is the lack of teacher training in the area, especially in the technology related to online teaching resources for this reason, the need to improve fluency development is evident this problem leads to the following question: How can speaking Fluency be boosted in high school learners?

Given that voice recording applications have been shown to work well with high school students, they will be used as a tool to help them improve their fluency in English according to experts in the field, students improve their fluency when using voice applications such as VoiceThread, Vocaroo, and Voki (Saman et al., 2018).

In other words, (Cevallos et al., 2015) mentions that "voice recording applications allow teaching and learning English oral skills in an effective and motivating way" (pg. 147). Gevorgyan (2015) mentions that voice recording applications are an appropriate strategy for young learners because they can record their answers, avoid mistakes, self-evaluate, reinforce their confidence and see their progress in their oral skills.

The general objective of this research will be to implement voice recording applications for the development of L2 speaking fluency to achieve this goal, there are three specific objectives that will assist in its achievement:

1. To review empirical and non-empirical literature for the development of L2 speaking fluency.
2. To measure speaking fluency among high school learners
3. To measure the effectiveness of these applications on the development of speaking fluency.
4. To propose recommendations for teachers on how to use voice recording applications.

This research project is based on the quantitative approach and the type of research was quasi-experimental because the participants were divided into two groups, an experimental group and a control group, which was evaluated through the use of pre and post-tests a group of 61 high school students enrolled in the Santo Domingo High School, who were between 14 and 15 years old and could use English at an A2 level. The results of the intervention will be shown in tables and graphs to compare the data obtained more efficiently it is expected students improve their L2 Fluency with the use of voice recording applications.

The importance of this research lies in the impact of the use of voice recording applications during English classes that can generate a good performance in the fluency of students when expressing their ideas and may have better opportunities in the future. Teachers who decide to apply this type of digital application described in this research will benefit from new methods or strategies in teaching English

because they can generate in their students a greater capacity for oral expression a skill that will permit students to be independent of the language.

CHAPTER I. STATE OF THE ART

1.1. Voice recording applications

Voice recording applications are online asynchronous apps capable of recording a person's voice and sounds, saving it in a file format, share it with other compatible devices like a mobile phone or a computer (Annamaria Pinter, 2019) these applications are referred to as technological means that permit students to record their voices and transmit audio files these types of applications are downloaded on tablets, phones, or computers through browsers. For example, Vocaroo, Voki, and Voice Thread are an example of applications voice recorders (Thakur, 2015).

They are defined as applications that enable the acquisition, production, storage, recording, communication, and presentation of information through a microphone in other words, these applications are stand-alone software programs designed to achieve a particular purpose that xs recording the voice by making a note or any other recording that can be downloaded or shared through a link by a user to a mobile device or digital platform (Eshankulovna, 2021).

1.2. Differences in voice recording applications

Voice recording applications are part of a set of innovations on the web these applications contribute to the development of oral skills in students Vocaroo, Voice Thread, and Voki are applications that have special features such as the management of activities and their purpose, the time set for the tasks, easy access to apps on smartphones or through accounts on the Internet, and the way the student works individually or with the collaboration of the teacher (Cevallos et al., 2015).

Moreover, voice recording applications are considered interactive tools that collaborative multimedia slideshows with images, documents, and videos it permits learners to navigate pages and express their ideas in five ways: using voice with a mobile or computer device, text, audio file, or video through a webcam the teacher

can use interactive material in the free version, and it depends on how the professor distributes the number of resources according to the activity the educator plans the teacher can invite more than fifty users to this type of activity as well as more than thirty-five comments in various forms (Cevallos et al., 2015) (See table 1).

Chart 1. Comparing Voice recording applications
VOICE RECORDING APPLICATIONS

Criteria	Voice thread	Voki	Vocaroo
Interface	Web Smartphone: Android and iOS 9.0.	Web Smartphone: Android and iOS 9.0.	Web
Price	Free	Free	Free
Duration of activities	30 minutes	60 seconds	There is no time limit
Interaction	Public	Private	Private
Interface Language	English	English	English
Account	Requires an account	Requires an account	No account registration required

Source: Bolduc & Simpson (2014)

Note. This table describes the differences between voice recording applications

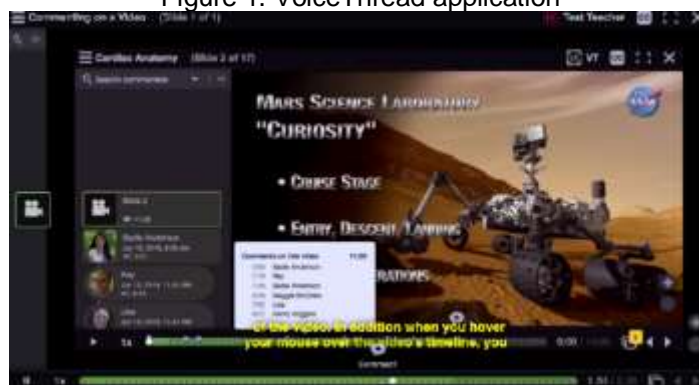
In other words, voice recording applications differ from other applications because they are free and interactive to learn (Sung & Poole, 2017) they are pedagogical applications that permit students to establish their character and create original presentations, comics, and animals, which can be incorporated into a type of text, activities, or assessments in the virtual classroom. Thakur (2015) says that voice recording applications contribute to generating better informative activities such as the presentation, storing, processing, or gathering of data, mainly including collaboration and communication.

It is important to consider that voice recording applications have different characteristics such as language, price, and duration of the activities, among others all these characteristics contribute to the fact that based on the practice of oral skills,

teachers can choose the best one and adapt each of these applications based on the needs of the students (Cevallos et al., 2015).

VoiceThread

Figure 1. VoiceThread application



Note. Adapted Voice Thread application by Brunvand, 2011

VoiceThread is a web application or collaborative sharing tool that allows teachers and students to make online presentations by adding assignments, photos, videos, narrations, and other digital multimedia resources (Brunvand, 2011). Therefore this application can be referred to as an online tool with various multimedia options accessible through the Internet and can be added to websites such as wikis, blogs, or learning platforms such as Moodle (Kent, 2013).

VoiceThread is an online tool to create multimedia albums in which we can insert documents (PDF, Word, Excel, and PowerPoint), images, audio, and video in which users can record voice comments through a microphone; video comments through Webcams, or text comments through a keyboard (Brunvand, 2011).

In addition, VoiceThread is a mobile app and asynchronous online tool that uses uploaded audio commentary, narration tools, text or annotations, and webcam video to support online discussions. Site supports comments focused on specific topics, permitting both teachers and students to regulate the posting of commentaries likewise, VoiceThread is a mobile app and asynchronous online tool that uses uploaded audio commentary, narration tools, text or annotation, and webcam video to support online discussions (Kent, 2013).

To sum up, VoiceThread is an engaging, easy-to-navigate, and interactive application in addition, it instructs teachers to implement various multimedia activities in class (Vera A. Dugartsyrenova et al., 2017).

Voki

Figure 2. Voki application



Note. Adapted Voky application by Yona & Marlina, 2014

It is a technological tool that permits the creation of an avatar, that is, a character or cartoon with a voice that explains a topic of interest to the author (Yona & Marlina, 2014) based on this statement, Voki is an application that create animated characters in order to use them in the classroom as an effective communication tool for teachers and students that can be used to improve the knowledge and understanding of a class (Gevorgyan, 2015).

Voki permits the user to express on the Web through an avatar character that can speak for the user, these characters can be personalized, add different types of voice, write messages, and add the user's voice through the phone, microphone, or an audio file (Prieto, 2013) this online widget produces a Voki or character that moves and speaks the text, the Voki can be inserted into a web page, blog, wiki, shared on social networks, or sent by email (Avila, 2021).

Voki is an application available on the Internet to create a virtual character, an educational avatar that speaks according to various indications it is software that you do not download but work online (Aikina & Zubkova, 2015). In the same way, it is a web 2.0 tool that permits us to speak through "text-to-speech" technology and the voice can be activated by text, a microphone, or telephone and is well designed

to support lessons aimed at developing students' speaking, listening, and writing skills (James et al., 2019).

Vocaroo



Note. Adapted Vocaroo application by Kim, 2018.

Vocaroo is an online application to record and save audio, download it in various formats or share it as a link on different social networks and educational platforms (Butarbutar, 2021), it stands out for its ease of use and does not require registration or additional software, and there is no recording limit. In general, Vocaroo is a simple tool that permits recording both voice and computer sounds it is an easily accessible application to record voice clearly, save and share in various formats in record time (Kim, 2018).

Vocaroo is a computer application to record audio online or upload it, download it, send it by email or social networks, or post it on websites. Is free and easy to use. The tool does not require registration and allows you to record the voice of a computer, we can send the audio as an attachment or as a link. The options that Vocaroo has are infinities, and it provides a creative way for students to submit their assignments in audio format and make audio comments without typing (Butarbutar, 2021).

Likewise, it is an application that recording voice messages in real-time without the need to install any apps (Giler & Quevedo, 2018) therefore, this tool is a fast and easy way to share voice messages through the interwebs and permits uploading

audio files with a maximum limit of 50 MB. The teacher or student records a voice message, revises his speech, or re-records it when it is ready; the audio clip is saved and shared (Serafini & Serafini, 2017).

Affordances for language learning

Voice recording applications have been inserted and used in different ways in foreign language teaching to improve fluency in a language (Pop et al., 2011) these apps have extraordinary opportunities to improve a second language, the frequent use of these achieves good results in skills such as fluency, permitting learners to expand their vocabulary, build confidence, and receive additional support while studying at home (CE et al., 2009).

We usually distinguish voice recording applications synchronously and asynchronously. Synchronous technology is communications in which people can talk to each other in real-time. On the other hand, asynchronous technology is two-way exchanges with a delay between messages or conversations (YanJu et al., 2017).

Voice recording applications have great flexibility teachers and students can participate in learning activities designed within this tool either in the classroom, in a laboratory of computing, or at home. In addition, students can participate in multimedia learning activities planned for a whole class, in small groups, or with individuals whose purpose is to strengthen their oral skills in a second language and encourage active participation in the process and development of language skills.

In these applications, the activities that can be carried out are: creating debates on different topics, commenting on movie themes, making poems in groups, presenting a task or text revision activity, collecting written, oral or audiovisual answers, and preparing multimedia documents such as tourism, watching videos and giving opinions and discussing advantages and disadvantages on a topic of interest.

In general these applications can be applied based on the proposed and developed strategies that permit interaction between students in a course, establish dialogues between peers and evaluate each other (Pardo Soto & Cisterna Zenteno, 2019). For example, students have the time needed to make and optimize comments, which leads to greater accuracy of expression and fluency, promotes collaboration among students, motivation for language practice, and positive effects on students' speaking skills (Pallos, 2011).

Besides, they are excellent applications in education, especially for language learning in the development of listening and speaking skills. Some main features are accessibility, message transmission, tool handling, recording, and listening to voice text. In general, they facilitate the development of skills in a second language, and teachers digitally record audio instructions to perform various activities of interest, tests, and correct feedback during class (Charles & Dickens, 2012).

In addition, the voice recording applications establish immediate recordings without a time limit, which has permitted the development of activities in this application to be attractive and dynamic because students can record, send and download messages for different tasks. For example, recording themselves reading stories to improve fluency, giving voice feedback, sharing a link with voice comments, practicing for class presentations, recording themselves, listening to themselves, practicing podcasting, interviewing a character, or role-playing (Le, 2018).

Alternatively, voice recording applications offer several opportunities for second language learning, especially for fluency development. They are perfect for language learning in both oral practice and motivational training of the learner (Tingen, Lauren & Lori, 2012). It means the learners can share their learning through voice messages and characters, express their opinions more easily, interact with topics of interest, and listen to their presentations (Ramdani, 2019).

The student can choose the style, background, characterizations, appearance, clothes, accessories of the character, and the type of language in the free version (Aikina & Zubkova, 2015). These applications record the voice of the students with

movements and gestures similar to them all to improve students' Fluency in English (Tingen et al.,2011). In other words, voice recording applications allow users to listen, correct, and even self-correct their soundtracks. Teachers and professors can express and share their ideas about a topic at any time from a comfortable space without the obligation to say something or make mistakes and improve their speech about vocabulary, pronunciation, fluency, and grammar (Bolduc & Simpson, 2014).

In the same way, these voice recording applications are tools that increase the creativity and imagination of students with the following activities: creating virtual presentations like speaking avatars, establishing topics of interest such as historical characters where students do an avatar with similar characteristics, commenting about themes that students propose in class and making short presentations to guess movie characters, songs among others (Kent, 2013).

Finally, these voice applications are useful tools to improve the oral skills of foreign language learners. The teacher elaborates the material and uploads it in the applications that students leave their comments, which can be listened to later and answered by the teacher. In addition, students can listen to their classmates' recordings and reply to each other. It makes possible to do several activities such as: showing a picture and describing it, posting a text that learners must read to check their pronunciation and fluency, watching a video and answering questions, uploading an extract from a movie, removing the sound and having them add new dialogues, compiling a collection of texts on a topic or creating a video of a tourist route, among others (Ghoneim, Abdelsalam, & Elghotmy, 2016).

The voice recording applications interface allows students to publish multimedia content for everyone to comment on. It makes it easy for users to add voice and comment on a document, slideshow, video, or photo collection. Learners can add comments via a microphone, webcam, keyboard, or phone that enrich the introduction of narration in audio format, for example, integrating audio into a presentation (Cevallos et al., 2015).

Apart from developing oral skills, voice recording applications offer collaborative work, encourage creativity, and give the option to listen to the recordings and learn from their mistakes. Learners carry out the activities without the presence of the teacher and develop more speaking abilities. It allows students to participate and not hide behind their shyness, lack of confidence, and nervousness when they have to make oral presentations (Kent, 2013).

1.3. Speaking Fluency

Speaking fluency is the ability to communicate easily and fluently without effort to find words or phrases. It involves the capacity to talk without frequent pauses, repetitions, and self-corrections (Shahini & Shahmirian, 2017). Fluency is the natural language when a speaker maintains explanatory communication. This communication would be clear and frequent despite limitations in communicative competence. A fluent speaker knows what to say and how to say something without pauses for thought (I. J. Yang, 2014).

Likewise, fluency refers to the mastery of speaking in an elegant, natural, and simple way for listeners. It allows effective communication with other speakers. Equally, fluency is the speed of speech, length of sentences, chaining of ideas, lack of excessive pauses, and absence of hesitation markers. In other words, fluency can be considered a relevant characteristic for oral expression, especially in a second language (Pekka & Pauliina, 2019).

Speaking fluency is the ability to talk with the appropriate terms in a given context that requires time to produce a speech at the same pace as native speakers without the problems of silent pauses, and repetitions, among others. Therefore, fluency is the ability of speech to be expressed correctly with a certain ease and spontaneity, both in the native language and in a second language; this allows communication to perform correctly (Jong, 2016).

Speaking with fluency is the fast, clear, concrete, perceptive, and effective transcription of the thought or expressive purpose of language. These definitions of

fluency have been accepted by most teachers and researchers, who have the perspective that fluency is different in nature from other units of oral ability. There are three dimensions of fluency as cognitive fluency, utterance fluency, and perceived fluency, which provide valuable meaning to fluency with cognitive development. This model focuses on underlying fluency and the influence of the social environment, which provides a view on the dynamic systems for fluency and its development. The following table shows the dimensions of fluency with their respective approaches (Segalowitz, 2010).

Chart 2. Fluency Dimensions

	Dimensions	Operationalized
Fluency	Cognitive Fluency	<ul style="list-style-type: none"> • Lexicon entry • Lexical retrieval • Control of linguistic attention • Working memory capacity
	Utterance fluency	<ul style="list-style-type: none"> • Speed fluency • Breakdown fluency • Repair fluency
	Perceived fluency	<ul style="list-style-type: none"> • Ratings

Source: Segalowitz, N. (2010)

Note. This table describes the fluency constructs

1.4. Types of Speaking Fluency

Cognitive Fluency

Cognitive fluency in a second language distinguishes a speaker because of their ability to plan and establish an effective discourse. In other words, cognitive fluency is about the speaker's ability to employ the cognitive processes responsible for fluent speech production. It does not relate to the mental process but to the feeling that people relate to the process. Continuous exposure to units in the target language as input repetition and intensive production practice output repetition is essential to obtaining competence and fluency (Segalowitz, 2010).

Cognitive fluency refers not only to establishing word-meaning relationships (Unkelbach, 2006). Cognitive fluency is essential for the more complicated aspects

of message formulation and comprehension, such as phrases and sentences. Satisfactory indices of cognitive processing can help as frameworks for L2 development. Therefore, cognitive fluency requires daily practice and repetition for learners to be able to make phrases and sentences on their own and not memorize them (Belker & Carbon, 2010).

Social psychologists Hyunjin Song and Norbert Schwart (2008) conclude that cognitive fluency makes people focus on the dynamics of their information processing and are very sensitive to their emotions, good or bad. Any factor can facilitate or hinder the fluid development of information to people's criteria and decisions. Therefore, educators have a considerable role in education because they properly present information to facilitate this process (Alter & Oppenheimer, 2009).

Utterance Fluency

On the other hand, utterance fluency is a special particularity of utterances that express the cognitive fluency of the speaker. Utterance Fluency can be objectively measured through speech samples such as speed fluency, decay fluency such as pauses and hesitations and reparative fluency. Utterance fluency is divided into speed fluency, breaking fluency and repair fluency.

Chart 3.Aspects of Fluency
Typically Measures

SPEED	Speech and articulation rates
BREAKDOWN	Frequency and length of pauses
REPAIR	Self-corrections, repetitions

Source: Hunter, A. (2017)

Note. This table describes the aspects of fluency.

Speed fluency is a skill acquired through frequent exposure to L2 inside and outside of the classroom, and over time this skill evolves to become more concise, more natural, and more accurate in a learner. However, this does not indicate that speed is totally understood or adequately measured. During this time, thanks to the technology, the speed can be measured by applications, and get better results. There are different types of technological tools such as Clan, Goldwave, and Praat

among others, in which researchers to measure important aspects of fluency (Tavakoli & Wright, 2020).

Breakdown fluency is an objective measure that shows the pauses and silences that break the bass of the speech. It is represented by three measures, the number of silent pauses per second of spoken time, the number of pauses per second of spoken time, and the average duration of silent pauses (Tavakoli & Wright, 2020). Repair fluency is related to the development of self-control of speech as well as the learner's effort to express a clear message.

It is related to personal speaking styles, and for the development of that, students can work with open questions where they can naturally express their ideas and with more continuous the speaking activities, they will get better results. The purpose of the repair measure is to make the message clear and cause a good impact. Similarly, they express that this skill can be measured through technological means such as the clan tool in which autocorrections, repetitions, substitutions and hesitations can be identified during a limited time (Huensch & Tracy-Ventura, 2017, p. 2).

Perceived Fluency

The third notion is perceived fluency, which can be defined as listeners' inferences about speakers' cognitive fluency based on their knowledge of their verbal fluency (Tavakoli & Wright, 2020). Perceived fluency is related to cognitive fluency, which involves a succession of linguistic knowledge and processing skills. Listeners make inferences about the validity with which the speaker establishes their message by seeking selective attention to the features of what is stated thus concluding the effectiveness of the speaker and the L2 knowledge for speech production, i.e., cognitive fluency (De Jong, 2018).

Finally, perceived fluency emphasizes that listeners may focus only on the transitory features of the dialogue or subjectively assess the speaker's ability to activate their linguistic resources. Studies show that, although the listener has been instructed to

focus on transitory traits, evaluators' fluency knowledge has a close relationship with non-transitory features such as grammatical errors. It means that many factors are involved in the development of perceived fluency (Suzuki et al., 2021).

Each of these three dimensions is closely related as they focus on specific particularities of fluency. Segalowitz (2010) points out that utterance fluency, perceived fluency, and cognitive fluency are in a way related not together in a single process, but they do complement each other in certain aspects of fluency, for example, verbal fluency can be measured more comfortably as technology progresses and perceived fluency can be obtained from ratings. The relationship between verbal fluency and perceived fluency allows aspects of fluency that are perceptually salient aspects of utterance fluency to achieve the speech signal that listeners consider essential.

How do we measure utterance fluency?

Objective measures are relevant units of fluency to measure speech rate and silent pauses. Additionally, it is important to discuss two important aspects of how to measure fluency. The first involves frequency efficiency measures, which are based on averages or percentages, allowing comparisons to be made between different studies and data sets. The second aspect is the decomposition measures which are pauses essential for the processing and production of language (De Jong, 2018).

Chart 4. Measures of Utterance Fluency

<i>Speech rate</i>	The number of syllables per minute, with pause time.
<i>Pruned speech rate</i>	Number syllables – total time
<i>Articulation rate</i>	Number of syllables per minute, without pause time
<i>Pace</i>	Number of stressed syllables – total time
<i>Mean length of utterance</i>	the mean number of syllables between two silent pauses
<i>Number of silent pauses (per minute)</i>	Number of silent pauses – total time or speaking time
<i>Mean duration of silent pauses</i>	Pausing time/number of silent pauses
<i>Phonation time ratio</i>	Speaking time/ total time
<i>Number of repetitions (per minute)</i>	Number of repetitions/total time of speaking time
<i>Number of repairs (per minute)</i>	A number of repairs and restarts/ total time or speaking time.

Source: Segalowitz, N. (2010)

Note. This table describes the measures of utterance Fluency

An objective measure is a decomposition fluency, which involves the measurement of pauses and silences. The two types of measures play a crucial role in speech production. Bosker (2013) argued that pause frequency, duration, and silence are an indicator as they affect the perception of fluency. Other authors such as Pr fontaine, Kormos, and Johnson (2016) indicate that learners are not affected by pause persistence if pauses occur at clause limits. In other words, pause fluency is significant because it plays an essential role in the skills of speaking fluency.

Developing L2 speaking fluency

Oral repetition and practice have been considered one of the main strategies for improving speaking fluency in the second language (L2) learning. In addition, constant oral repetition can be used as a strategy for the learner to develop language skills. Studies on individual differences in language learning have shown that it is important to maintain and rehearse phonological information in working memory in order to maintain active verbal fluency. The use of oral repetition has proven to be useful and can be supported theoretically as well. Studies of specific differences in language learning have shown that it is important to retain and repeat phonological information in working memory (Gathercole, 1995).

The connection of short-term phonological memory with long-term memory in language learning is fundamental to linking lexical and syntactic units in order to maintain fluency; in general, it is considered that students have more difficulty with sentence production when sentences contain new words or unfamiliar phrases, hence the importance of continuous repetition and practice of unfamiliar sentences for the student to assimilate the new learning (Papagno, 2017).

Considering that new information increases the cognitive load on working memory, fluency is more likely to be hindered when L2 learners have to process new words; however, in the classroom, it is difficult for a teacher to focus attention on each learner to point out errors in speaking, individual differences may vary even more as the number of new vocabulary items in a sentence increases. Practice can reduce these disfluencies (Hunter, 2017).

One of the most effective ways to solve this problem is the use of voice recording applications that are not only beneficial from a linguistic but an emotional one. This simple feature of each of these applications offers the possibility to repeat and practice through voice recording, the immediate opportunity to see your performance and to re-record it if it is not correct (Yoshimura & MacWhinney, 2007).

The digital recording makes the performance tangible and visible and provides instant feedback. The review process permits students to be aware of their strengths and weaknesses and listen not only to their recording but to the input of others, resulting in conversations about what was consistent and what needed to be changed through dialogue or sentence formation this repetition and practice allow the student to develop their language and fluency in language learning (Yoshimura & MacWhinney, 2007).

Voice recording applications are technological tools that are capable of transmitting clear and good-quality voice audio and can be implemented by the teacher in the teaching and learning process. Krashen (1983) affirms that the learner constantly listening to quality spoken texts develops listening skills considerably, and this will be reflected in the development of students' oral skills. Therefore, it is essential to provide the learner with as many audio texts as possible for analysis and to facilitate repetitive practice. Voice recording applications allows the transmission of quality an audio texts in such a way as to optimize the improvement of the target language (Ramdani, 2019).

Another effectiveness of using voice recording applications is that they are a good alternative for students with limited vision or reading skills. They are used as evaluative activities for students. They motivate learning a foreign language such as English and are meaningful learning situations. The following table shows the effectiveness of voice applications in various research studies.

Effectiveness of voice recording applications

Studies	Interface	Type of study	Assessment instrument	Participants	Findings
Ghoneim, Abdelsalam & Elghotmy, (2016)	VoiceThread/ 6 weeks	Quasi experimental	The Speaking skill test was designed by the researchers	N=30 Egypt Menoufia University	The results showed a significant advantage ($p < 0.05$) and the effect size was (% 71), which is greater than the value of the large effect size (% 15) in relation to the development of fluency skills in EFL.
Zemlyanova et al., (2021)	VoiceThread 14 weeks	Quasi-experimental	Speaking conversation Students' attitude and engagement questionnaire	N= 44 Russia Tyumen University	The investigation with the application of VoiceThread in relation to EFL Fluency Skills was significant ($P < 0.05$) between the experimental group and the control group in the post-test.
(Saman et al., 2018)	VoiceThread 5 weeks	Quasi-experimental	PET speaking test	N=18 Iran Razi University	The results revealed that there was a statistically significant difference between the pretest and posttest of the experimental group. The value was ($p < 0.004$).
AIOkaily, (2021)	VoiceThread 6 weeks	Quasi-experimental	IELTS test	N=38 18-20 years United Arab Emirates University	The results showed that with the use of the VoiceThread application there was a statistically significant difference between the pretest and the posttest in the control and experimental groups ($p < 0.001$).
El-Zayat, (2019)	VoiceThread 6 weeks	Quasi-experimental	TOEFL and IELTS sample tests.	N=30 Egypt Mansoura University	The large effect size was 79% variance in the students' speaking skills. The mean scores of the experimental group students on the pre-post administration of the EFL fluency skills were significant at the ($p < 0.05$) level significance.
Pop et al., (2011)	VoiceThread Voxopop 5 weeks	Quasi-experimental	TOEFL, CAE Tests.	N=62 Romania Dimitrie Cantemir University	The VoiceThread recording application in the investigation both in the experimental and control groups in the statistical results obtained the ($p < 0.03$) of significance in the pre-test and post-test.

Ramdani, (2019)	Voki 6 weeks	Quasi- experimental	PET test	N=25 Indonesia MH Thamrin University	This research on Voki resulted in the level of significance pre and post-test ($p < 0.05$).
Gaona, (2020)	Voki 5 weeks	Quasi- experimental	PET test	N=50 Ecuador Casa Grande University	The application of Voki to improve oral skills reveals that the intervention was successful with a significant result ($p < 0.05$).
(James et al., 2019)	Voki 4 weeks	Quasi- experimental	IELTS test	N=20 Malaysia Kebangsaan University	The investigation of the use of Voki with storytelling, reveals that the intervention was good in the experimental group in the post-test with a significant result ($p < 0.04$).
Cevallos et al., (2015)	Voki, Vocaroo, and VoiceThread 5 weeks	Quasi- experimental	PET test	N=100 Ecuador ESPE University 18- 20 years	There was a significant difference between both groups ($p = 0,005$), which indicates that the use of the technology (Voki, Vocaroo, and VoiceThread) was great to improve fluency speaking abilities.
Nguyen & Nguyen, (2021)	Voki 10 weeks	Quasi- experimental	IELTS test Interview: attitudes towards the use of Voki	N=47 Vietnam Vietnam University 18 years	The p-value for oral performance was ($p < 0.05$). This means that the Experimental Group improved much more than the Control Group in the final post-test.
Butarbutar, (2021)	Vocaroo 5 weeks	Pre- experimental	PET test	N=40 Indonesia Makassar University	The application Vocaroo was helpful for teaching and learning speaking ability, the statistics results were significant ($p = 0.05$)
Kim, (2018)	Vocaroo, VoiceThread 8 weeks	Pre- experimental	TOEIC test	N=62 South Korea Korea University	The use of Vocaroo and VoiceThread improved speaking skills in the post test, the statistical results were significant ($p = 0.05$).
Simaluisa, (2021)	Vocaroo 6 weeks	Quasi- experimental	KET test	N=36 Ecuador Uta University	The statistic T-student statistical test was used to notice the differences before and after the application of the experiment with Vocaroo, the statistical results were significant ($p = 0.04$).

Based on the findings of the studies, it can be inferred that Voki and VoiceThread are the applications that most promote collaboration among students but allow teachers to implement various language-oriented activities. In addition, these applications were executed in a period of 4 to 14 weeks, which had good levels of significance. Therefore, these applications allowed the participants to develop peer dialogue activities and express points of view and opinions (Ghoneim, Abdelsalam & Elghotmy, 2016).

On the other hand, Vocaroo is a simple application, free but with a limited number of functions. The application time of this app was 5 to 6 weeks, obtaining as a result, the development of oral skills in students, but the researchers conclude that this application allows expressing comments, statements, and opinions in general, but it does not catch the attention of students or create more communication links between students (Simaluisa, S, 2021).

These three apps have a common goal which is to develop second language oral skills, but each one has different options to achieve this goal. However, VoiceThread is considered with a higher level of effectiveness in achieving language learning, especially in terms of fluency. It is because VoiceThread has several options, such as videos and presentations, which allow the participant to express their ideas creatively and attractive way (El-Zayat, 2019, p.).

In addition, for the effectiveness of this research, it was possible to identify that the type of study chosen to obtain a good result was quasi-experimental. In other words, having two study groups, one control and one experimental, allowed the results to be clear and consistent and to establish a clear difference in the pre and post-test (Cevallos et al., 2015). Finally, the assessment instruments most commonly used in the studies were tests such as PET, KET, TOELF, and IELTS, which were used to evaluate criteria such as fluency, pronunciation, coherence, and vocabulary (Kim, 2018).

CHAPTER II. METHODOLOGY

Research methodology is specific procedures used to identify, select, process, and analyze information on a topic likewise, the research methodology is a study of the discovery of solutions to organized and social difficulties through purposes and methodical analysis it means that the research methodology is an efficient and effective orderly approach to achieve the desired results therefore, for the development of the methodology, it is necessary to include the type of research, the deep level of the methodology, the research modality, and the research instruments (Rajasekar, 2013).

This chapter will present the research methodology, including the research design, the instruments, the specific intervention, and the pre-experimental study.

2.1. Research design

The type of research was quasi-experimental because were considered two study groups, one experimental and the other control. Quasi-experimental research designs that aim to detect the impact of an intervention in an experimental group and a control group. This type of design is useful to estimate the impact of an intervention where the subjects or observation units have not been assigned according to a random criterion (Eyisi, 2016).

This research project was quantitative, and the type of research was quasi-experimental because the participants were divided into two groups, an experimental group and a control group. In addition, it is a quasi-experimental design because we used existing class groups. There was not random group assignment. Regarding the level of research depth, the present study was inferential because we made inferences about the effect between the variables.

Participants

Population refers to the universe, set, or totality of elements that are investigated or studied. The sample is a part or subgroup of elements that are previously selected from a population to carry out a study. Likewise, sampling is the method used to choose the components of the sample from the total population. These are a group of rules, procedures, and criteria in which a number of elements is chosen from a population that represents what happens in the whole population (Sukla, 2020).

This study was conducted with $N=61$ participants at the Santo Domingo de Guzmán School. This is a private institution located in the city of Ambato which offers grades from primary level to high school. In terms of English teaching, the institution has a study plan for strategic subjects. This school promotes the development of logical, critical, and creative thinking that encourages productive and meaningful learning, thus opening this new vision not only institutionally but nationally issued through the Ministry of Education.

Six years ago, the institution implemented a bilingual curriculum that has generated good results in the development of foreign language learning. Usually the subjects taught are language, science, traditional games and English with 70% in a foreign language. The main objective is for students master English from an early age. Students have 8 hours of English classes, 5 hours of language, 4 hours of science and 2 hours of traditional games per week. Likewise, the school has a good list of bilingual teachers prepared to teach students according to their educational stage.

As table 5 shows, the participants were divided into two groups, an experimental group in which the treatment was applied and a control group. Most of the participants are girls. They were in the 10th grade of secondary school, their age was 15, and their English proficiency level according to the CEFR is A2-B1.

Table 1.
Sample description of experimental and control group.

		Males	Females
		Total	
Experimental Group	7	23	30
Control Group	7	24	31
		N= 61	

Author: Lopez, C. (2022)

Note. This table describes the experimental and control group.

2.2. Research instruments and techniques

Regarding instruments and techniques, were used a speaking test before and after the intervention to measure the fluency in different speaking tasks. A standardized speaking test, the Preliminary English Test (PET) speaking test B1 proficiency from of Cambridge assessments was used as a reference in this research.

In addition, the speaking part was selected for this research. As well, before the application of the test, a pilot test was conducted with 20 students and then some changes were made in the first part of the test only five questions were selected, in the second part two pictures and two questions were about a relevant topic, in the third part was selected a specific situation and one question and in the fourth part was adapted two questions related to the part three.

Oral test components and assessment

The test consisted of four parts. The first part consisted of some information questions about the test taker. The first is about personal information.

- What is your full name?
- How old are you?
- How do you spend your free time?
- Which sports did you play?

- What do you want to be in the future?

The second part refers to a discussion the participant looks at two pictures and describes a situation based on two questions:

- Which situation do you prefer?
- How do you think that young people nowadays are different from those a few years ago?

Figure. 4 Speaking Test



Note. Adapted speaking test PET by Taherdoost, 2016.

The third part of the speaking test focuses on encouraging learners to look at pictures and talk about them. The participant describes these images and answers a question.

A young woman works hard and has only two free days a week. She wants to find an activity to help her relax. Talk about the different activities she could do, and then decide which would be most interesting to do?

Figure. 5 Speaking Test



Note. Adapted Speaking test PET by Taherdoost, 2016.

The four-part of the speaking test consisted of asking the participants two questions about the pictures that have already been described in part three.

- What do you do to relax?

Figure. 6 Speaking Test



Note. Adapted speaking test PET by Taherdoost, 2016.

For the collection of information for this research of the pre and post-test, the application Extempore was used for a self-directed oral interview with the four parts of the test, in this application, the students recorded their answers.

Validity and reliability

The validity of an instrument refers to the authenticity of qualities or characteristics to be studied in an investigation. While, validity is the precision or accuracy of the measurement. In other words, validity and reliability refer to the accuracy of the variables proposed in an investigation. Consequently, the instruments to be used in this research project, such as the extempore application to record student responses and the test, will be validated by the tutor of the research project (Taherdoost, 2016).

The evaluation instrument of the present research was the standardized (PET) speaking test targeted at level B1. The instruments were validated and piloted in the same place the investigation was conducted to verify their reliability.

For the validity of the standardized test (PET) was done a pilot test in the educational institution with tenth-grade students in which were evaluated the fluency metrics through the Extemporate and Praat tools. The first procedure was the review of scientific articles in which this standardized test (PET) has been applied. After reviewing this information, the students were selected randomly to evaluate the test. The initial part was about personal information, the second part referred to image discussion, the third part to image description, and the fourth part referred to several questions related to the third part of the test. The students recorded their answers in the Extemporate application, and the following data were obtained:

- The students developed the test in the best possible way.
- They used their mobile devices to perform the test.
- The students needed more time than set due to the number of questions.

Then, the Praat tool was used to check the fluency measures, which showed that speech rate and articulation speed were correctly measured. Once the pilot test was applied, it was necessary to modify the number of questions to students develop their fluency more spontaneously to collect only relevant data for the study and use images related to topics of interest to the students. The validation of the instruments took about a week from its application to its approval by the research tutor.

In order to determine the reliability of the instrument, the Jamovi statistic was used, which results are established by the range stipulated by Cronbach's Alpha coefficient.

Table 2. Reliability

	Cronbach's Alpha	
	Speech rate	Articulation rate
PART 1	0.853	0.759
PART 2	0.943	0.862
PART 3	0.834	0.766
PART 4	0.797	0.768

Source: Jamovi statistics

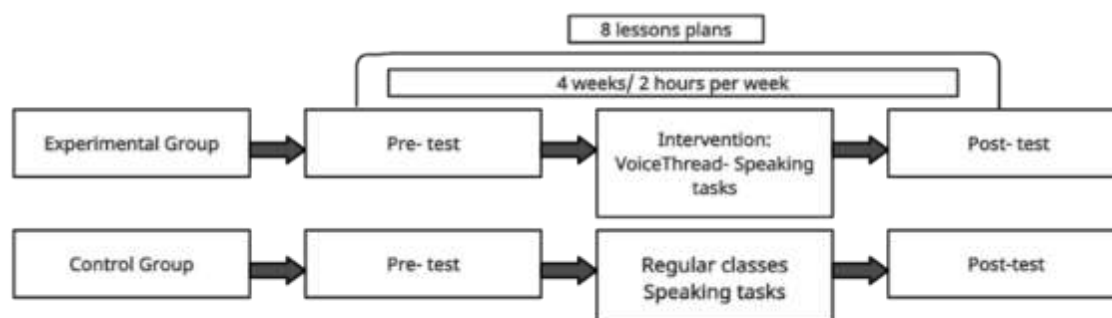
Note. This table describes the reliability of the test.

Table 2 shows the coefficient of each of the parts of the instrument according to the measures of fluency, speech rate, and articulation rate, which were considered acceptable and adequate for the development of the research.

2.3 Intervention

For the development of this intervention, two groups were chosen non-randomly. The intervention consisted of 8 lesson plans that included the use of the VoiceThread voice recording application with the experimental group while the control group received regular classes without the use of any application for a period of four weeks.

Figure. 7 Experimental and control group



Author: López, C. (2022)

With the experimental group before the intervention, the participants were evaluated with the speaking test, during the first week, there was a short induction on the use of VoiceThread in the recording of responses for each of the tasks. Likewise, in the same week, the participants started to do the first task about mysterious places. Each week they completed two speaking tasks in this application on topics such as debate videos, discussion topics about celebrities, video games, vacations, future dreams, and a reflection video all with the purpose to improve their English fluency. After the application of the treatment, the participants were evaluated with the speaking test.

On the other hand, the control group was evaluated at the beginning with the speaking test and, after the same number of weeks, speaking activities were conducted in pairs or individually as regularly worked in classes with the same

planned topics. Finally, they are evaluated with the same speaking test to assess their fluency.

The following tables show the intervention that was carried out with the experimental group, which consisted of 8 planning lessons in which interesting topics were discussed with the students. In the same way, then there are pictures of the activities developed in the VoiceThread application.

Table. 3 Intervention Lesson Plans

Topic 1: All about me

Subject: Traditional Games		Responsible: Angela Cristina López Infante	
Skill: Fluency		Period: (5 minutes)	Year: 2021-2022
Content	Objective	Activities	Resources
<ul style="list-style-type: none"> ✚ Adjectives ✚ Imperatives ✚ Sentences in present or future 	<p>Students will be able to:</p> <ul style="list-style-type: none"> ✚ Create a poster, and upload their product to VoiceThread where will record themselves describing their interests and hobbies. 	<ul style="list-style-type: none"> ✚ Step one: Make a canvas poster about interesting things and hobbies you want to share. ✚ Step two: Enter the VoiceThread and upload your poster image, then record yourself explaining the details of your poster. ✚ Step three: Publish the recording. 	<ul style="list-style-type: none"> ✚ VoiceThread ✚ Canvas

Author: López, C. (2022)

Topic 2: Mystery Places

Subject: Traditional Games		Responsible: Angela Cristina López Infante	
Skill: Fluency		Period: (5 minutes)	Year: 2021-2022
Content	Objective	Activities	Resources
<ul style="list-style-type: none"> ✚ Adjectives ✚ Imperatives ✚ Sentences in present or future 	<p>Students will be able to:</p> <ul style="list-style-type: none"> ✚ Talk about what happened in that mystery scene. 	<ul style="list-style-type: none"> ✚ Step One: Go to the VoiceThread. ✚ Look at the picture about: ✚ Answer the following question: What is the mystery of the Easter Islands? ✚ Record yourself expressing your thoughts about the mysterious place. 	<ul style="list-style-type: none"> ✚ VoiceThread

Author: López, C. (2022)

Topic 3: video discussion: Social Media, Social Life: Teens Reveal Their Experiences

Subject: Traditional Games		Responsable: Angela Cristina López Infante	
Skill: Fluency		Period: (5 minutes)	Year: 2021-2022
Content	Objective	Activities	Resources
<ul style="list-style-type: none"> ✚ Adjectives ✚ Imperatives ✚ Sentences in present or future 	<p>Students will be able to:</p> <ul style="list-style-type: none"> - Discuss the video: Social media, social life: teens reveal their experiences and give your opinion about it. 	<ul style="list-style-type: none"> ✚ Join the VoiceThread: ✚ Listen to the instructions ✚ Watch the video: https://www.youtube.com/watch?v=GGGDfciqyvw ✚ After, watching the video, answer the following question? ✚ What do you think of social networks and the use of these applications? 	<ul style="list-style-type: none"> ✚ VoiceThread

Topic 4: Famous people

Subject: Traditional Games		Responsable: Angela Cristina López Infante	
Skill: Fluency		Period: (5 minutes)	Year: 2021-2022
Content	Objective	Activities	Resources
<ul style="list-style-type: none"> ✚ Adjectives ✚ Imperatives ✚ Sentences in past and present 	<p>Students will be able to:</p> <ul style="list-style-type: none"> ✚ Describe your favorite celebrity. 	<ul style="list-style-type: none"> ✚ Step one: Find information about the celebrity. ✚ Step two: Login to VoiceThread ✚ Step three: Upload a poster about their favorite celebrity ✚ Step four: record the main ideas in a short presentation. 	<ul style="list-style-type: none"> ✚ VoiceThread

Author: López, C. (2022)

Author: López, C. (2022)

Topic 5: How to play Minecraft

Subject: Traditional Games		Responsible: Angela Cristina López Infante	
Skill: Fluency		Period: (5 minutes)	Year: 2021-2022
Content	Objective	Activities	Resources
<ul style="list-style-type: none"> ✚ Adjectives ✚ Imperatives ✚ Sentences in present or future 	Students will be able to: <ul style="list-style-type: none"> ✚ Express some strategies to win Minecraft. 	<ul style="list-style-type: none"> ✚ Students will enter the VoiceThread application. ✚ Watch a video about Minecraft https://www.youtube.com/watch?v=MmB9b5njVbA ✚ Students talk about how to play the game: Minecraft. 	<ul style="list-style-type: none"> ✚ VoiceThread

Author: López, C. (2022)

Topic 6: Vacations

Subject: Traditional Games		Responsible: Angela Cristina López Infante	
Skill: Fluency		Period: (5 minutes)	Year: 2021-2022
Content	Objective	Activities	Resources
<ul style="list-style-type: none"> ✚ Adjectives ✚ Imperatives ✚ Sentences in present or future 	Students will be able to: <ul style="list-style-type: none"> ✚ Express your ideas about your vacations 	<ul style="list-style-type: none"> ✚ Step one: Login to VoiceThread ✚ Step two: Listen to instructions ✚ Step three: Look at a short presentation in PowerPoint about vacations. ✚ Step four: Record yourself explaining your vacations. 	<ul style="list-style-type: none"> ✚ VoiceThread

Author: López, C. (2022)

Topic 7: Video "The Present"

Subject: Traditional Games		Responsible: Angela Cristina López Infante	
Skill: Fluency		Period: (5 minutes)	Year: 2021-2022
Content	Objective	Activities	Resources
<ul style="list-style-type: none"> ✚ Sentences in present or future 	<p>Students will be able to:</p> <ul style="list-style-type: none"> ✚ Express your ideas about the video. 	<ul style="list-style-type: none"> ✚ Step one: Login to VoiceThread ✚ Step two: Listen to instructions ✚ Step three: Watch the video https://www.youtube.com/watch?v=WjqIU5FgsYc and make a final comment answering the following question: ✚ - What attitude does the main character have? ✚ - What does the dog represent? ✚ - What would you change after seeing this story? ✚ Step four: Record yourself. 	<ul style="list-style-type: none"> ✚ VoiceThread

Author: López, C. (2022)

Topic 8: My dreams

Subject: Traditional Games		Responsible: Angela Cristina López Infante	
Skill: Fluency		Period: (5 minutes)	Year: 2021-2022
Content	Objective	Activities	Resources
<ul style="list-style-type: none"> ✚ Adjectives ✚ Imperatives ✚ Sentences in present or future 	<p>Students will be able to:</p> <ul style="list-style-type: none"> ✚ Express your ideas about your dreams. 	<ul style="list-style-type: none"> ✚ Step one: Login to Voice thread ✚ Step two: Listen to instructions ✚ Step three: Create a WordArt: https://wordart.com/ with the theme my dreams and upload it to VoiceThread. ✚ Talk about your dreams for the future based on the presentation in WordArt. ✚ Step four: Record yourself. 	<ul style="list-style-type: none"> ✚ VoiceThread

Author: López, C. (2022)

VoiceThread Intervention

Figure 8. All about me



Source: Self -made

Figure 9. Mystery Places



Source: Self -made

Figure 10. My Dreams



Source: Self -made

Figure 11. Famous People



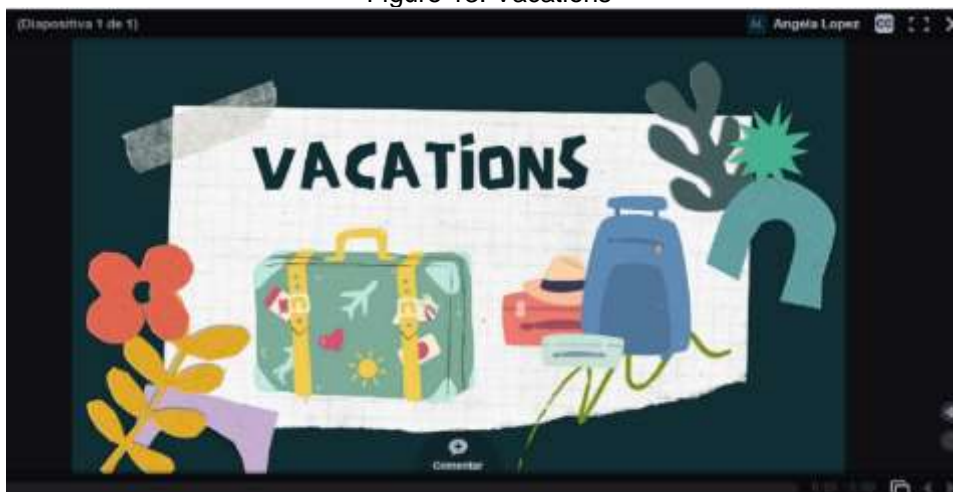
Source: Self -made

Figure 12. How to play Minecraft



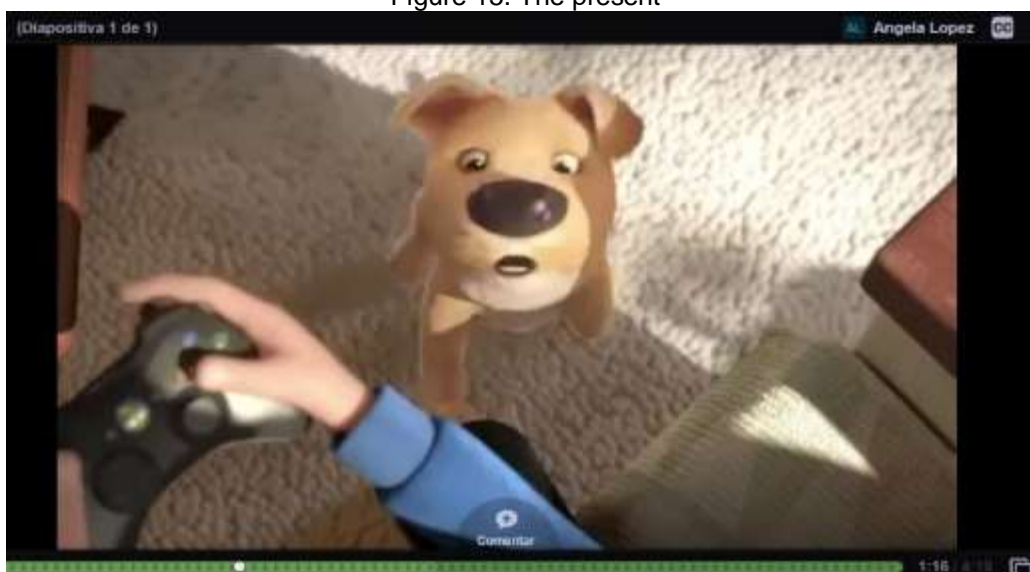
Source: Self -made

Figure 13. Vacations



Source: Self -made

Figure 15. The present

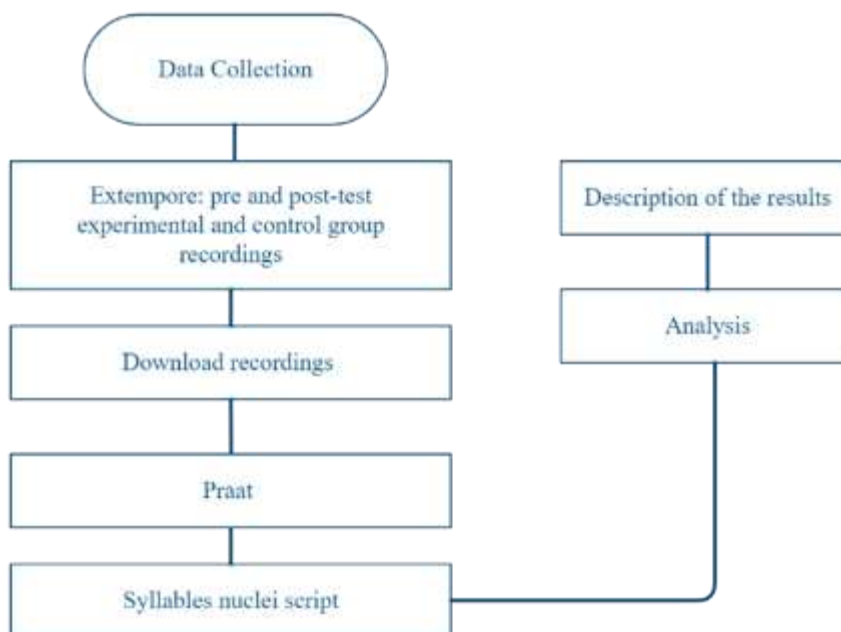


Source: Self -made

Procedure

Data collection for this study consisted of three stages: pre-test, intervention, and post-test. For data, processing tabulation was used in Extempore and Praat to facilitate reliability and data validation.

Figure. 16 Data collection process



Author: López, C. (2022)

In Extempore, the data collection process was that students received a brief induction about this application. Then, participants opened an account with a personal email. Next, they entered the classroom with a class code where they each recorded their test-based responses speaking test. Likewise, for data collection in Praat, the first step was to download Extempore recordings pre and post-test of the experimental group and the control group and then organize them in folders with the Wav format. Finally, the syllables nuclei script was opened in Praat. The results obtained were the number of syllables, speech rate, articulation rate and the number of pauses, among others (De Jong, 2018).

Figure. 17 Extemporate data collection

Username	First Name	Last Name	Email	Submissions	Extra Time
alejandramartinez	Alejandra	Martinez	alejandramartinez@unf.edu.ec	5	
alisonmiranda	Alison	Miranda	alisonmirandaquinala@unf.edu.ec	5	
anabel2_paredes	Anabel Paredes Morales	Anabel Paredes Morales	anabelparedes2020@gmail.com	5	
arrettia_aguapalo	Arrettia	Aguapalo	arrettiaaguapalo@unf.edu.ec	5	
berenely_cunata	Berenely	Cunata	berenelycunata@unf.edu.ec	5	
bryonmartinez1	Bryon	Martinez	bryondani123@gmail.com	5	
camila_carvajal	Camila	Carvajal	camila.carvajal@unf.edu.ec	5	
domenica_vela	Dominica	Vela	domenicavela@unf.edu.ec	5	

Author: López, C. (2022)

Figure. 18 Extemporate data collection

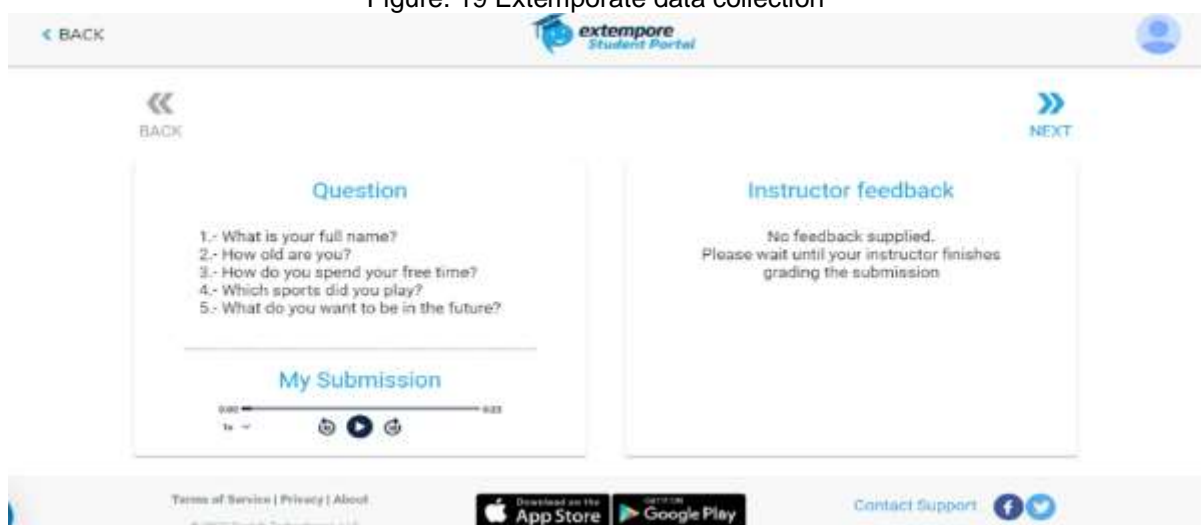
PRE-TEST FLUENCY

Submitted

1 2 3 4

Author: López, C. (2022)

Figure. 19 Extempore data collection



Author: López, C. (2022)

Figure. 20 Extempore data collection



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Analysis: fluency metrics

The syllable nuclei script, is created in a study with the purpose of detecting syllables and measuring the fluency of a language. This script allows obtaining information about fluency metrics, such as raw metrics, like speaking duration, and compound metrics, such as speech rate, articulation rate, number of pauses, and number of syllables (de Jong & Wempe, 2009).

For the present research, the syllable nuclei script was selected because it automatically detects fluency metrics without the need for transcription and make

possible the research work to obtain the data. The composite metrics were chosen for the analysis such as speech rate and articulation rate. Speech rate because it refers to the number of syllables per unit of time and is a good predictor of subjective fluency. The articulation rate because it is a measure of the rate in which all pauses are excluded from the calculation, and this helps to identify both naturalness and fluency of speaking (Dankovicova, 2021).

Figure.21 Praat data collection

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RESULTS-EG-POST-TEST: Bucle de datos
Archivo Edición Formato Ver Ayuda
soundname, nsyll, npause, dur (s), phonationtime (s), speechrate (nsyll/dur), articulation rate (nsyll / phonationtime), ASD (speakingtime/nsyll)
soundname, nsyll, npause, dur (s), phonationtime (s), speechrate (nsyll/dur), articulation rate (nsyll / phonationtime), ASD (speakingtime/nsyll)
PRE-EG_001, 385, 35, 107.996, 91.692, 3.565, 4.199, 0.238
PRE-EG_002, 675, 42, 216.936, 161.744, 3.112, 4.173, 0.248
PRE-EG_009, 267, 22, 103.778, 61.280, 2.573, 4.357, 0.250
PRE-EG_011, 453, 63, 162.984, 99.428, 2.779, 4.556, 0.219
PRE-EG_012, 711, 56, 188.432, 49.264, 1.948, 4.281, 0.233
PRE-EG_017, 500, 56, 131.864, 71.952, 2.356, 4.263, 0.234
PRE-EG_020, 203, 19, 77.424, 47.488, 2.622, 4.275, 0.234
PRE-EG_013, 483, 74, 139.680, 80.468, 2.807, 4.903, 0.201
PRE-EG_014, 419, 77, 162.808, 100.048, 2.572, 4.188, 0.239
PRE-EG_016, 264, 108, 169.488, 60.928, 1.558, 4.331, 0.231
PRE-EG_007, 590, 55, 181.152, 123.120, 3.202, 4.711, 0.232
PRE-EG_008, 271, 27, 97.584, 56.976, 2.777, 4.756, 0.218
PRE-EG_015, 859, 77, 287.976, 207.616, 2.983, 4.137, 0.242
PRE-EG_018, 218, 31, 94.176, 59.664, 2.315, 3.654, 0.274
PRE-EG_019, 292, 18, 97.392, 70.880, 2.998, 4.120, 0.243
PRE-EG_005, 1367, 323, 504.288, 281.552, 2.711, 4.855, 0.286
PRE-EG_004, 680, 66, 247.584, 151.712, 2.747, 4.482, 0.223
PRE-EG_006, 280, 37, 123.456, 74.368, 2.268, 3.765, 0.266
PRE-EG_008, 320, 36, 117.840, 74.672, 2.716, 4.285, 0.233
PRE-EG_010, 453, 55, 162.720, 100.896, 2.784, 4.490, 0.223
soundname, nsyll, npause, dur (s), phonationtime (s), speechrate (nsyll/dur), articulation rate (nsyll / phonationtime), ASD (speakingtime/nsyll)
POST-EG_014, 292, 18, 97.392, 70.880, 2.998, 4.120, 0.243
POST-EG_018, 218, 31, 94.176, 59.664, 2.315, 3.654, 0.274
POST-EG_013, 453, 55, 162.720, 100.896, 2.784, 4.490, 0.223
POST-EG_015, 203, 19, 77.424, 47.488, 2.622, 4.275, 0.234
POST-EG_016, 1367, 323, 504.288, 281.552, 2.711, 4.855, 0.286
POST-EG_017, 680, 66, 247.584, 151.712, 2.747, 4.482, 0.223
POST-EG_018, 280, 37, 123.456, 74.368, 2.268, 3.765, 0.266
POST-EG_020, 320, 36, 117.840, 74.672, 2.716, 4.285, 0.233

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CHAPTER III: ANALYSIS OF THE RESULTS

This chapter describes the analysis of the results obtained by the students after the treatment of voice recording applications as a means for the development of L2 speaking fluency.

Based on the information obtained, data was collected through the speaking test performed on 10th-grade students of the Santo Domingo de Guzman High School in Ambato, province of Tungurahua. After the information was collected, the results of the test were processed in Praat and also making use of the Jamovi statistics program that shows the results of the specific tabulation.

Table.1 Descriptive statistics speech rate and articulation rate.

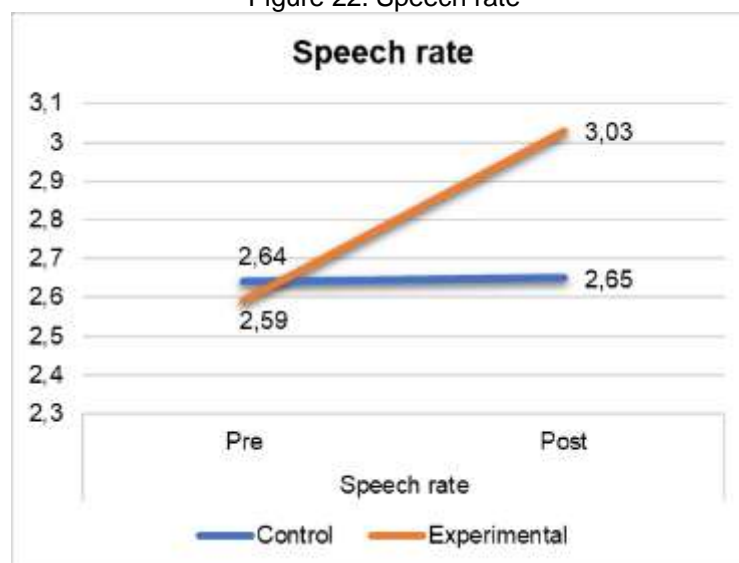
Group	N	Speech rate				Articulation rate			
		Mean		SD		Mean		SD	
		Pre	Post	Pre	Post	Pre	Post	Pre	Post
Control	31	2.64	2.65	0.454	0.454	4.24	4.24	0.388	0.429
Experimental	30	2.59	3.03	0.336	0.616	4.48	4.70	0.384	0.485

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Table 1 shows the results obtained for the speech rate as well as the articulation rate. The table presents the population data, the mean and standard deviation of the pre-and post-test of the control group and experimental group. An analysis of each fluency metric will be presented to validate the hypothesis.

3.1. Analysis speech rate

Figure 22. Speech rate



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Analysis and interpretation

The figure shows that, in the control group, in the speech rate, 31 participants were evaluated and obtained a mean of 2.64 in the pre-test, results that were taken as a base before the application of the post-test. Likewise, the results of the post-test showed that the mean was 2.65, which represents that there was a slightly better without applying any intervention.

In the control group the speech rate did not increase from pre- posttest (t (df...) = 0,843 p 0,933 Cohen's $d=0,015$). In Anova the results in the control group the speech rate did not increase from pre- posttest (F (df=1) = 0,007 p 0.933).

On the other hand, in the experimental group, in speech rate, 30 participants were evaluated, who obtained the pre-test a mean of 2.59 while the results of the post-test showed that the mean was 3.03, which demonstrates that there was a considerable increase. It is because the intervention was conducted through 8 speaking tasks with the use of the VoiceThread application.

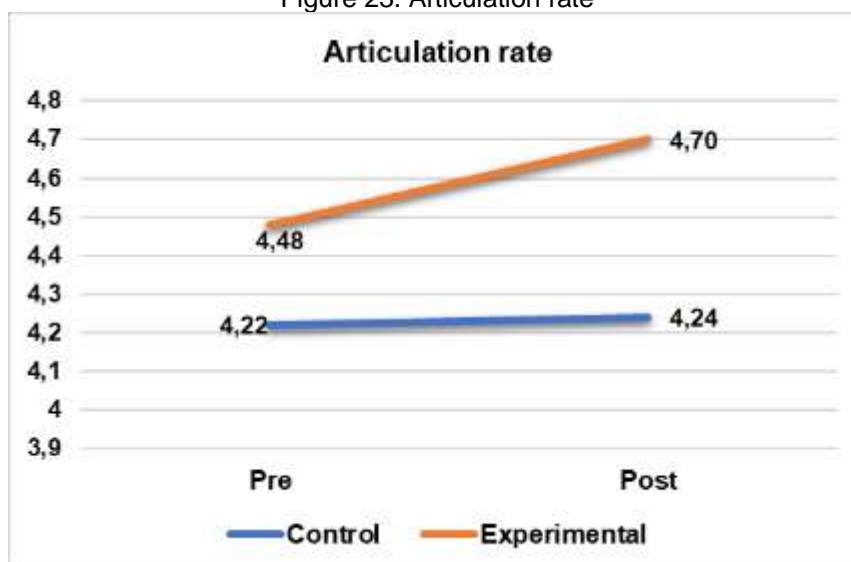
For hypothesis analysis, the t-test was applied, which obtained a result: in the experimental group the speech rate significantly increases from pre- posttest (t (df...) = 3,88, $p < .001$, Cohen's $d = 0,50$).

In Anova the results in the experimental group the speech rate significantly increases from pre- posttest (F (df=1) = 12,7, $p < 0.001$).

According to the results described, in the control group, the speech rate of the pre-test and post-test was slightly adequate, due to the speaking activities were developed according to the established planning. While in the experimental group, the results of the pre-test and post-test, in the speech rate were significant and positive, because VoiceThread was applied for approximately four weeks. After the intervention in the classroom, participants were evaluated through the voice recording application obtaining satisfactory results, it means that the participants increased the number of syllables per unit of time.

3.2. Analysis articulation rate

Figure 23. Articulation rate



Author: López, C. (2022)

Analysis and interpretation

The figure shows that in the control group, in the articulation rate, 31 participants were evaluated who obtained the pre-test a mean of 4.22 results that were taken as a base before the application of the post-test. Likewise, the results of the post-test showed that the mean was 4.24, which shows that there was a slightly better without applying any intervention.

In the control group the articulation rate did not increase from pre- posttest (t (df...) = -0.193, p . 0.848, Cohen's d = -0.0141).

In Anova the results in the control group the articulation rate did not increase from pre- posttest (F (df=1) = 0,0373 p 0.848).

On the other hand, in the experimental group, the articulation rate was evaluated to 30 participants, who obtained the pre-test a mean of 4.48 results that were taken as a base before the application of the post-test. As well, the post-test results showed that the mean was 4.70, reflecting that there was a significant increase after applying eight speaking tasks in four weeks.

For hypothesis analysis, the t-test was applied, which obtained a result: in the experimental group the articulation rate significantly increases from pre- posttest (t (df...) = 2,39, p . 0.020, Cohen's d =0,306). In Anova the results in the experimental group the articulation rate significantly increases from pre- posttest (F (df=1) = 12,6, p <0.001).

According to the results, in the control group, the articulation rate of the pre-test and post-test was the same there were no changes because the speaking activities were conducted, based on the programmed planning. While in the experimental group, the articulation rate of the pre-and post-test showed positive and favorable results, due to the fact that the intervention was applied with the use of voice application for a period of four weeks, which means that the participants correctly articulated a large number of syllables without pauses and their speech was more fluent and

natural. Finally, the application of the T-test and the Anova, determine that the voice recording applications generate significant changes in the development of L2 fluency, which confirms that the intervention produced satisfactory results in students' learning.

CONCLUSIONS

- During the development of this research project, it was possible to determine that: the implementation of the voice recording applications contributed to the development of L2 speaking fluency. Therefore, this method was effective because students expressed in each of the Voice Thread tasks their ideas in a natural way achieving that they can communicate in a better way.
- For the process of measuring fluency, the students were divided into two groups, an experimental group and a control group in a non-randomized way in which the experimental group was given the intervention, and the control group was given activities that usually take place in class, all this with the purpose of identifying whether or not the students developed fluency in English.
- The results were significant for the experimental group because the use of voice recording applications allows them to improve fluency in a certain period of time, while the control group remained at a similar level to the one they started with and there were no significant changes at the end. Therefore, this research is considered feasible to practice in classrooms and improve the students' oral skills.
- The use of voice recording applications allowed to verify whether or not the development of fluency occurs, although the literature describes three-voice recording applications that provide similar functions, in the intervention, only one was chosen to measure the effect of fluency was VoiceThread which let students interact and record their responses based on various topics such as video games, videos or talk about their dreams each of these topics managed to attract the attention of students and permit a time of four weeks to achieve a significant increase in their fluency.
- Finally, the use of voice recording applications results to be pedagogical tools of great help for the teacher in the classroom. Therefore, proposing this type of digital tool generates that teachers can expand their knowledge and produce

better results in the oral skills of students, being this a good option to attract the attention of the student and generate confidence to express their ideas and can communicate fluently in the classroom.

RECOMMENDATIONS

- For the development of fluency, it is recommended that future research consider new contributions from the literature, due to date of this work, there are very few studies on this topic, and this work can be the basis for new contributions to strengthen linguistic fluency in high school students.
- In this research, we worked with two groups of 10th grade students but in the future, it would be of great interest to work with groups of high school or university-level students to determine the importance of voice recording applications to develop fluency in groups with greater knowledge and mastery of the foreign language.
- Several voice recording applications allow the development of fluency. During this research, three types of recording were mentioned, however one of them was applied because the three had similar characteristics of usefulness, but it will be of great importance in a new research process to apply the three types in order to define which of these three applications is the most viable and has better results for student learning.
- Being part of a teaching group, and especially being part of the English area, it is my responsibility to recommend to all those professionals who practice the English language to use voice recording applications as part of their classroom work planning. It will motivate the student to improve personally and know their individual and group progress after a certain period.

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ANNEXES

Annexe 1: Instrument

Part 1: All about me: answer the following questions.

- 1.- What is your full name?
- 2.- How old are you?
- 3.- How do you spend your free time?
- 4.- Which sports did you play?
- 5.- What do you want to be in the future?



Part 2:

1.- Look at the pictures and describe what happens in each one.

2.- Answer the following questions: Which situation do you prefer?

How do you think that young people nowadays are different from those of a few years ago?



A



B

Part 3: Describing a situation: A young woman works very hard and has only two free days a week. She wants to find an activity to help her relax. Talk about the different activities she could do, and then decide which would be most interesting to do.



Part 4: Look at the pictures and answer the following question: What do you do to relax? (Why?)

