



PONTIFICIA UNIVERSIDAD CATÓLICA DEL ECUADOR

Facultad de Ciencias de la Educación

Facultad de Comunicación, Lingüística y Literatura

Trabajo de Titulación como requisito previo para la obtención del título de
Magíster en Pedagogía del Inglés como Lengua Extranjera

**Interactive Software to Teach Technical Vocabulary to A1 and pre A1 Ecuadorian
Adult English Students Using Contextualized Stories.**

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Quito, abril 2022

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**INTERACTIVE SOFTWARE TO TEACH TECHNICAL VOCABULARY TO A1
AND PRE A1 ECUADORIAN ADULT ENGLISH STUDENTS USING
CONTEXTUALIZED STORIES**

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Date:

April 2022

ABSTRACT

This paper investigates the development of software designed to help adult students learn Informatics technical vocabulary using interactive storytelling. The aim of this study is to identify and analyze how six adult A1 EFL students feel and learn when using non-conventional educational technological tools. It is important to take advantage of current technological advances in order to develop inventive language learning resources that can help students learn in a meaningful and engaging way, not only in the classroom but at any time. The study presents the development of software that uses a combination of many branches of language learning theory such as English for specific purposes, vocabulary learning in adults as well as storytelling in order to improve the Informatics technical vocabulary of learners. By interpreting the data gathered from a user experience survey and a vocabulary test conducted after the participants interacted with the software, this study concluded that: Interactive storytelling helps beginner students to learn technical vocabulary and make them more confident in their reading skills. However, combining two typically difficult subjects such as English and Informatics overwhelmed some learners and discouraged them from using the developed software more than necessary. These results suggest that interactive storytelling can be used in the process of teaching and learning general and technical English vocabulary as well as improving reading.

Keywords: adults, gamification, software, storytelling, technical vocabulary,

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Abril 2022

RESUMEN

Este proyecto investiga el desarrollo de software diseñado para ayudar a estudiantes adultos a aprender vocabulario técnico sobre informática usando narración de historias. El presente estudio pretende identificar y analizar como seis estudiantes adultos con niveles de inglés entre Pre-A1 y A1 se sienten y aprenden al usar herramientas tecnológicas no convencionales. Es importante aprovechar los avances tecnológicos actuales para desarrollar recursos que ayuden a cualquier estudiante a aprender de un modo significativo y atractivo, no solo en el aula de clases sino que en cualquier lugar a cualquier hora. Este estudio presenta el desarrollo de software que utiliza teorías acerca del aprendizaje de idiomas como Inglés para propósitos específicos, aprendizaje de vocabulario en adultos así como la narración de historias para mejorar el vocabulario técnico acerca de informática en estudiantes principiantes del idioma inglés. Al interpretar los datos obtenidos por una encuesta de experiencia del usuario y una prueba de vocabulario realizadas después de que los participantes interactuaran con el software, este estudio concluyó que: La narración interactiva de historias ayuda a estudiantes principiantes a mejorar su vocabulario técnico así como hacerlos sentirse más seguros en su lectura del idioma inglés. Sin embargo, combinar dos materias que típicamente han sido consideradas difíciles como lo son el inglés e informática desmotivó a algunos estudiantes ocasionando que no utilizaran el software desarrollado más de lo necesario. Estos resultados sugieren que la narración interactiva de historias puede ser usada en el proceso de enseñanza y aprendizaje de vocabulario general y técnico de inglés así como mejorar la lectura.

INTRODUCTION

Background

Ecuador has one the lowest level of English in Latin America according to Education First (2020), an organization dedicated to cultural interchanges and language learning, Ecuador ranked 93rd among 112 nations around the world. While these results are not fully representative of the population's actual level of English, they provide a useful insight about the country's reality. It is clear that there is room for improvement in the methodologies and approaches that are used for teaching English in the country. However, English is not the only subject where Ecuadorians are struggling. Ecuador has a significant portion of population whose technological skills are pretty much non-existent, according to the INEC (2017) around 10% of Ecuadorian adults are technological illiterates. Given the importance of both English and technological literacy in our current globalized world (especially during the sanitary emergency the world is currently living where technology has taken a major role in the way we interact with others), it is necessary to develop strategies that can help our students improve their English as well as technological skills, so they can face the challenges our modern world poses.

In this globalized and technological world the need for learning English is more important than ever; Ecuador seems to acknowledge this reality as there have been efforts for improving the teaching of English in the public educational system such as the focus on communicative language and student-center teaching, mentioned in the 2016 Foreign Language curriculum by Ministerio de Educación del Ecuador (n.d.). Ecuadorian people have realized the importance of this language and seek for resources that suit their necessities; one particular group, adults between 18 and 45 years old, have truly shown interest in learning English due to the opportunities this language offers, according to Heredia (2017). However, one of the main challenges students face, especially beginners, is the acquisition of enough and useful vocabulary that allows students to express their ideas easily.

Beginner students are often the ones which struggle the most when learning English, their limited vocabulary as well as their little knowledge of the grammatical rules prevents them to fully comprehend text or ideas. Even though grammatical

structures are important in order to fully understand the language, with an adequate amount of topic-related vocabulary it is virtually possible for any student to at least comprehend the main idea either by guessing from context, working with morphological analysis or even relying on similarities between their L1 and L2 words meaning (Lightbown and Spada, 2013). Hence, the urgency of build a lexicon capable of giving the student the ability to grasp the gist of any text, lecture and content, the formation of vocabulary is a key part of the language learning process that needs to be addressed. In order to achieve this goal, the classical paradigms that have been present in the Ecuadorian English classroom have to be challenged, big lists of words expected to be memorized without any context should be replaced with more engaging resources that not only increase the student vocabulary, but also grow student's interest in the language; thus, facilitating the learning process.

In this context, this research explores the requirements needed to develop interactive software that can help adult Ecuadorian English students learn technical vocabulary about informatics, foster autonomous language learning from students outside the classroom hours and most importantly familiarize students with current technology. By combining different areas of knowledge such as vocabulary learning in adults, English for specific purposes, technology and gamification it is possible to create a product that is relatable and resonates with a specific group of population and that can be accessed anywhere, at any time and by anyone provided the availability of the required electronic device. Hence, the developed software can be used as a complementary or supplementary resource inside or outside the classroom depending on the needs of the students, time constraints of the curriculum, creativity of the instructor, etc.

The core of the research is the implementation of digital storytelling as a tool for learning technical vocabulary in a compelling way. By taking into account the language learners' level and their cultural background it is possible to present subjects that have been traditionally considered as difficult to teach not only in the English classroom but in general courses (such as Informatics) in a compelling way. The use of contextualized stories that Ecuadorians students can relate to, allows teachers to innovate and, at the same time, reach their students and build a healthy environment where learning takes place.

During one month, six participants were taught technical vocabulary by interacting with the developed application. The technical vocabulary covered the basics of Informatics: common devices used in modern day such as computer peripherals, smartphones as well as software and internet terms. After the treatment, a test was conducted in order to draw conclusions regarding how much students' technical vocabulary had been increased. Finally, a user experience survey was conducted to collect feedback that will help improve the system for future projects.

Relevance and Importance of the Research

During the sanitary emergency it was clear that technology, as a means of communication, became prevalent and sometimes the only option available in many fields such as education, business, sales, entertainment and many others. Together with the role of English as the lingua franca, the necessity for mastering both technological skills and the English language has become more important than ever. In fact; in order to apply for better job opportunities, receive online classes from prestigious universities around the world, using state of the art software, or just for entertainment purposes, those with technological literacy and English language knowledge have a significant advantage over those who do not possess such skills.

For those reasons, the current study focuses on helping students to develop the basic skills to function effectively in a technology-based society that becomes more and more complex with each passing day. The study provides a model for designing interactive software that uses storytelling as a means to help Ecuadorian adult English beginner students to learn technical vocabulary -which in this particular case is focused on Informatics (hardware, software, internet terms, etc)-, but that can be modified as the instructor sees fit in order to present different kind of vocabulary, focused grammatical structures and many other approaches. The use of current technology in language teaching provides adaptable and reliable resources that are easy to distribute, modify and monitor, thus, easing teaching. This research constitutes a starting point from which future projects that combine software, language teaching and the Ecuadorian cultural background can benefit from by modifying it and adding more features.

The written project is divided as follows:

Section I - Problematic, this section describes the general context in which the research took place, data regarding the actual levels of English and technological literacy in the country is presented in order to provide insight on the national reality that Ecuadorian English learners face. This information leads to the problem statement which focuses exclusively in the particular educational context of the group of students who were involved in the research. Finally the benefits, possible implementations and future improvements of such proposed approach are presented in order to proof the relevance of the study.

Section II - Theoretical Framework, this section is divided in two parts: the first one contains previous researches that are related with the current project, a brief review of the methodology, objectives and conclusions are provided in a succinct manner in order to obtain a strong base for the current project development. The second part consists on the theoretical foundation of the project; theories and existent references in which the development of the project is based upon are presented in an organized and coherent manner. In order to get a wide perspective of the fundamentals, many authors have been cited whose contributions to the field allow the current project to be developed in a solid manner.

Section III – Methodology, this section presents the design and type of research made which includes a detailed description of the instruments, the process of gathering data and the involved population in the different stages. This section also includes how the instruments were delivered to that population and in which conditions they were conducted. Additionally, the analysis techniques utilized in the current research are described together with the limitations found during the process. This information was used to draw the implications and contribution to knowledge of the study.

Section IV - Results and Data Analysis, this section analyses and contrast all the data gathered through the different instruments presented in the methodology section. This section organizes the collected data and presents it in the form of charts and tables which then are interpreted and analyzed in order to draw possible explanations for the results obtained, supporting references are introduced in order to build legit remarks. The section is focused in answering the research questions and underline relevant results and new findings.

Section V - Proposed Approach, in this section the developed approach is presented and described with full detail; a great emphasis on the developed activities, the process involved and the target audience is considered through the section. It also presents the structure of the proposed approach as well as the recommended techniques and schedules for its implementation.

Conclusions and Recommendations, these sections mainly focus on extracting the implications of the project. It highlights the most prominent findings as well as possible applications in the future. It also highlights the weakest and strongest points of the research and contrasts them with possible solutions or modifications that can improve how future researches based on similar topics address the language teaching using technological tools.

CHAPTER I PROBLEMATIC

Problem Statement

The current research took place in a private institute where students, usually female ones, learn professional skills such as tailoring, embroidering and hairdressing. English is taught at this institute as a complementary subject; two weekly hours of English are scheduled in the curriculum. Students' age varies from 14 to 60+ years old; their level of English tends to be very limited as their only contact with the language has been in the classroom. In fact, older students who have not been in a classroom for a long time report they have forgotten pretty much all the English language they have learned during their school life (had they received such class). Younger students, especially those who just finished middle or high school, tend to be more positive about their English knowledge. In a similar manner, the technological competence of the students is limited and depends a lot on how much time they have been absent from a classroom environment. In fact, younger students have a greater technological competence; the introduction of smartphones in daily life has contributed a lot to develop this digital literacy in younger generations; however, they lack the knowledge to effectively use their electronic devices beyond just checking social media and sending pictures. Abilities such as identifying computer components, determining which electronic device is suitable for their needs, using cloud services, using office software and browsing internet effectively are missing.

Even though students' levels of English vary, there are several patterns that seem to repeat over students' competence; For instance, students usually remember the use of simple and progressive present tenses and are familiar with basic vocabulary. Past and perfect tenses as well as modals are vaguely remembered or directly unknown to them. Their reading skills are consistently more developed than their writing, listening and speaking. In fact, oral skills are very underdeveloped and often students tend to confuse English phonemes with those of their mother tongue, Spanish. This information was taken from brief interviews that students have with their English teacher on the first day of class. Students' claims seem to be accurate as the results of the diagnostic test, held in the same first day of class, reflect the student level. Considering the above, students'

English levels can be easily categorized as A1, according to the CEFR. In fact, considering that most of the participants have a very low level of English they may be sub-classified as pre-A1 starters level, which according to Alexiou and Stathopoulou (2021) have very limited language skills; for instance, their listening comprehension is limited to recognition of simple statements provided they are delivered slowly and clearly, their reading comprehension is limited to recognition of familiar words provided they are accompanied by pictures. Regarding production skills, pre-A1 learners are able to produce short phrases about basic personal information and rely on body language when speaking.

Bearing this in mind, the aim of this research is to develop interactive software that uses storytelling as a mean to teach technical vocabulary about Informatics. Our study presented this resource to six Ecuadorian adult English students and measured how much technical vocabulary they acquired.

Research Questions

The current research is designed to answer the following research question:

What are the requirements to design interactive software that can help A1 English students to learn technical vocabulary about Informatics using contextualized stories?

In order to answer the former question, general and specific objectives that have to do with the different areas of the research are proposed:

General Objective

To develop an interactive software application to help A1 English students to learn technical vocabulary using contextualized stories.

Specific Objectives.

To design an interactive interface for an application that allows the use of contextualized stories that help English students to learn technical vocabulary about Informatics.

To compose contextualized stories taking into account the CEFR A1 English level guidelines and the Ecuadorian cultural background.

To determine the impact the implementation of the developed interactive software has in adult English Ecuadorian students.

CHAPTER II

THEORETICAL FRAMEWORK

There are many papers that address the benefit of implementing digital storytelling in language teaching. “Digital storytelling is a rich interactive learning, often transformational process, that stimulates the imagination, creative thinking, language learning, and the cooperative learning processes” (Stanley, 2018, p. 1). In fact, as digital storytelling is an activity that involves many cognitive processes it is inevitable that the cultural background of the author and the target audience influences how the story is told. In that regard, in order to offer compelling digital storytelling it is important to consider the learner’s cultural background, students that feel identified with the story are able to reaffirm their cultural identities; hence, enjoy and participate in the activity. Furthermore, taking advantage of the flexibility and adaptability software applications offer also guarantees that students remain engaged with the digital storytelling activity and allows the creation of new ways to help students to improve their language skills and increase their vocabulary. In fact, by cleverly programming how the user is going to interact with the software it is possible to provide instant feedback to the student in the form of reinforcement questions, comments, sounds, images and virtually any kind of feature the teacher sees fit; thus, helping students when the instructor is not present; for example, outside the classroom hours. In order to develop the intended interactive software application many studies were considered, as it is stated in the following section.

Relevant studies

Before designing the software and writing storytelling, a top priority was to choose the adequate technical vocabulary to be taught. This step required many considerations that involved classifying terms, identifying the frequency of those terms and many more.

Chung and Nation (2004) mention that:

Technical vocabulary is a major concern for learners who have special purposes in language learning. However, surprisingly little is known about such

vocabulary, largely because there are no well-established approaches for deciding which words are technical terms and which are not” (p. 1)

In order to solve this inconvenience, they proposed the comparison of four different approaches to identifying technical words in an anatomy text. The first method consisted in a rating scale approach to identify the terms that fall into the sphere of specialized meaning; words were classified as technical or nontechnical by rating them on a four point scale. As this method was the most thorough and direct, it was used as the basis of comparison for the other approaches. The second approach consisted in the use of a technical dictionary, choosing what technical dictionary to use was the first step; the largest dictionary is not necessarily the best as it may include many words that are not technical terms. The third method consisted in using clues provided in the text such as explicit definitions, bolding or italicization among others. Interpretation of clues in the text required a lot of judgement. The fourth method was a computer-based approach; by using several statistical algorithms that compared the number of occurrences, linguistic cues such as word form analysis, part of speech or grammatical structures; the study used a program called RANGE which successfully identified terms with efficiency and in a relatively short time. After comparing each method, it was concluded that the computer-based approach worked very well and was the most practical to use.

After considering the previous work and the fairly limited amount of technical vocabulary to be taught, it was concluded that rating the words from the informatics curriculum of the institute in which the research took place was the best option. The next logical step was to find ways to incorporate vocabulary teaching with technology. Several studies have covered very similar topics that suggest that even though the technological tool used changes, the learning process benefits from its inclusion.

Currently, technology has gained a privileged position in our daily lives; even though it is not as prevalent in education, the use of technological tools has been proved beneficial to both teachers and students. Katwibun (2014) investigated the effects of using an interactive whiteboard (IWB) in vocabulary teaching. The study took place at a public high school in the northern region of Thailand with a total of 51 11th grade students. Three 50 minute-lesson plans of vocabulary consisting of three steps:

presentation, practice and production were conducted; the lessons were given with three IWB instructional media packets. The study demonstrated an increase in students' academic performance and participation, however, students' participation dropped slightly at the end of the lesson if the IWB accommodated the whole period of teaching, it seems students preferred this method as a part of the lesson. A similar study was conducted by Wu et al. (2014) who investigated how the use of smartphones can help ESL college students learn English vocabulary. 50 college students at Jiujiang University of China were randomly divided in two groups: control and experimental group. 852 vocabulary items with its respective meaning in Chinese were taught to the students in both groups which also were asked to study those items outside class sessions. The only difference between the groups was that students from the experimental group were allowed to study the vocabulary using Word Learning, a Java application software which compiled all 852 words with seven features: meaning in the Chinese language, antonyms, synonyms, spelling, proper pronunciation, part of speech and examples presented in sentences. The results showed that the experimental group outperformed the control group in the vocabulary acquisition post-test.

Lu (2008) investigated the effectiveness of Short Message Service (SMS) vocabulary lessons of limited lexical information. The study mentions that there is abundant evidence that suggests m-learning (learning assisted by mobile technologies) can greatly benefit EFL learners by offering them large exposure to the target content at any time; hence, fostering self-learning. It also points out that cognitive psychological research showed that memory can benefit the most from constant and distributed practice instead of massed practice. During two weeks, thirty one high school students were randomly distributed into two groups; each group received two sets of English words either on paper or through SMS messages. Their English proficiency level was intermediate according to their scores on the English test of the entrance examination and their ranking at school. The 28 target words (TWs) were the correct answers to the vocabulary tests of the entrance examination for 2-year and 4-year technological colleges in 2004 and 2005. The procedure consisted on: a pre-treatment questionnaire that asked participants three questions about their use of mobile phones, a pre-treatment test where participants were asked to recognize 50 words, the treatment where students of the mobile groups received two SMS lessons every day and students of the paper

groups were given paper material, the post-treatment questionnaire and interview and finally post-tests. Qualitative data from interviews showed that students in general are more positive towards learning vocabulary via mobile phone. It was concluded that mobile groups had greater vocabulary gains than their paper-group counterparts. However, there was a considerable attrition of vocabulary in delayed tests.

Yip and Kwan (2006) researched how online games foster vocabulary learning in undergraduate students. One important aspect considered in the research was vocabulary learning as a separate learning activity; apparently, the lexicon that organizes the vocabulary in a speaker's mind behaves as an independent entity when processing language. This implies that in order to improve the process of acquiring new vocabulary particular strategies are needed. The paper also mentions some considerations that vocabulary learning software should present; for instance: new vocabulary should be related to known vocabulary, multiple and meaningful exposure to new words should be as frequent as possible, the software should encourage and promote reading strategies in students. With regard to technical features: animations, sound components, hints or clues that can help students to decipher the word meaning are desired. Taking that information into account, during nine weeks, three teachers and 100 engineering students were divided in groups: an experimental group that learned vocabulary from two web sites which met the mentioned requirements and a control group which learned the same vocabulary through activity-based lessons. A pre-test and post-test were conducted together with survey questionnaires and interviews. Two lessons were delivered weekly, each one lasted 50 minutes. The experimental group was asked to carry out online vocabulary exercises in class and in their own time; after some instruction from the teacher, students were asked to explore the selected web sites. Lessons for the control group were facilitated by the teacher and consisted primarily in activities. The findings indicated that the experimental group outperformed the control group in the post-test. Students in the experimental group generally preferred a more complemented approach with conventional activity-based lessons supplemented with online learning. The teachers liked the online games, but they wondered how online games can be used as a core part of their teaching.

It is very important to notice how the use of technology allows for different interactive ways of learning, the inclusion of multimedia and fast navigation speed up

the process. However, it is worth noting that there is some reluctance in using these methods in a regular basis and sometimes the benefits seem to be limited to a short window of time.

The final component is the inclusion of the storytelling, in such regard; Gimeno-Sanz (2015) researched the benefits of using Digital Storytelling (DS) as an element of innovation and motivation with learners of English for Specific Purposes in an Aerospace Engineering career. The paper mentions DS is based upon telling stories, an old and traditional form of communication that can be utilized as a pedagogical tool which incentivizes learning by doing. The research mentions seven elements that sustain effective digital stories: Point of View, A Dramatic Question, Emotional Content, Economy, Pacing, The Gift of Your Voice and Soundtrack. The project was divided into the following stages: completing surveys before and after the treatment, learning about digital storytelling, sharing and commenting classmates' digital stories, presenting their “making of” to the whole class, and finally assessing both the digital stories and the oral presentations. The results showed that students developed different type of skills: i.e. linguistic skills, digital literacy, research and interpersonal abilities as well as problem-solving and critical-thinking skills. It was concluded that the DS project was a success among learners of English in aerospace engineering given the development of non-linguistic skills and language acquisition.

Storytelling by itself is an activity that people naturally enjoy; as suggested by the previous study, by adding some technological component to storytelling it is possible to improve students' motivation and learning. It is interesting to notice that even though learning vocabulary is the main goal of the study, other linguistic and non-linguistic skills may be developed depending on the implementation. For that to happen, it is necessary to also consider how the students may react and which strategies they may use when facing new technical vocabulary.

Wanpen et al. (2013) investigated and determined the differences on technical vocabulary learning strategies (TVLS) used by engineering students with different educational backgrounds. The paper mentions that there are two broad types of vocabulary learning strategies: discovery strategies and consideration strategies that can be further divided into determination strategies, containing strategies used by an

individual when facing new words; social strategies, which occurs when interacting with others; memory strategies, which involves recalling; cognitive strategies focused on mental processing and metacognitive strategies which evaluate the learning process. Taking that information into account, 47 undergraduate engineering students were asked to answer a questionnaire on technical vocabulary learning as well as to complete a technical vocabulary test. Three instruments were used in the study: a 30-item technical vocabulary test, a 56-item questionnaire with five categories: determination, social, memory, cognitive and metacognitive strategies, and a semi-structured interview to gather additional information. Descriptive statistics were used to describe TVLSs use, a test was carried out to check whether the differences in TVLSs use between students with different educational backgrounds were significant or not. The findings revealed that students with the educational backgrounds in vocational stream had higher technical vocabulary proficiencies than students whose educational backgrounds were in the general education stream. The findings also indicated that the most frequently used strategies by engineering students were metacognitive strategies.

Therefore, when designing a tool that combines many branches of different disciplines it is necessary to take into account many factors, organize them in a coherent manner and keep focus on the main objective of the research. As it has been suggested by the previous researches, there may be unintended results such as the development of additional skills. Inclusion of technology offers these possibilities due to its flexibility that allows the creation of many teaching methods. However, technology alone is not enough to learning to happen. For the current study it is also mandatory to consider the fundamentals of the vocabulary learning process, in this particular case how this occurs in adults.

Vocabulary Learning in Adults

Learning a language is a long process and not all people learn in the same way; hence, rapid solutions do not exist. Though, when referring to adults, there are some activities that have been researched on and proved useful for improving their learning of a foreign language. According to Martin et al. (2019), the presence of the teacher in the classroom provokes inhibition in adults when they are learning new L1 or L2 vocabulary; direct interaction with the teacher such as when doing a given task

provokes social inhibition in the adult student; hence, hindering their learning process. In order to prevent this from happening, it is necessary to explore social techniques that can provide adults a good environment of learning. Lytovchenko et al. (2018) points out that interactive English for specific purposes (ESP) learning methods are the most effective for teaching adult students at college level as they are more independent and responsible for their learning in order to obtain the maximum results than children and teenagers; the paper suggests: equal treatment between teachers and students, respect, and consideration of all opinions as valid methods that make students feel comfortable and relaxed; thus, forming a trustful relation in a non-authoritarian but supportive, informal and non-threatening learning climate. Once the learning environment fosters learning, it is time to consider the actual content to be taught and which strategies may work on students.

One of the most important aspects when learning a foreign language is using vocabulary, communication can be easily broken if the meaning of a specific word is unknown; however, a person can express ideas and understand them by just using words with little knowledge of grammar or pronunciation (Lightbown and Spada, 2013). Thus, a well-developed lexicon can help learners to convey and comprehend ideas easily. Even though vocabulary has so much importance in language learning, as Oxford and Scarcella (1999) mention, most of the time teachers expect students to learn vocabulary by themselves, but usually they do not teach them how to build it properly. In their research they mention that in order to solve this problematic, a set of factors that affects L2 vocabulary acquisition in adults need to be considered; for instance, adults are not constrained by cognitive development which allows them to add new words to their vocabulary as they do in their native language, frequency and the amount of attention paid to new words play a significant role as those words that are more frequent and impactful to students in textbooks are more likely to be learn, the order of acquisition is also a key factor as simpler words with few meanings and functions are acquired first; finally, as L1 and L2 vocabulary are not stored independently, they do not function as separate units which means that the language background affects the acquisition of vocabulary. Oxford and Scarcella (1999) also suggests the following instructional approach when teaching vocabulary: careful consideration of the words students need to know through analysis of the specific themes to be taught, personal needs and goals of

the students as well as taking into consideration words that are used frequently and are adequate for the student level. Tailored resources, guessing from context, paraphrasing, using word parts and mnemonic activities also help students develop strategies that they can use to build their vocabulary by themselves. In those cases where the level of English of students is still beginner-like, Tai and Khabbazzbashi (2019) agree that words in context facilitate students' comprehension; in addition, they suggest that the use of physical and gesture-talk resources help to convey the target vocabulary.

Adults learn vocabulary in different ways than children and teenagers. In addition, not all vocabulary is the same. Depending on the goals of the learner, the target vocabulary may vary and become more specialized; thus, the necessity of understand the principles of teaching specific topic that goes beyond general English classes.

English for Specific Purposes: Technical Vocabulary

Kenny et al. (2020) proposes a succinct definition for ESP, "English for Specific Purposes (ESP) provides English language instruction that aims to serve learners' communication needs in English in a certain domain." (p. 1). In fact, as this branch of English teaching has to do with very specific fields such as medicine, business, academic purposes, etc. (Kenny et al., 2020), it is inevitable that the target vocabulary would be equally specific and most of the time technical. Hence, the importance of correctly choosing the most frequent and useful vocabulary in the area of expertise to be taught. This can be done in many ways, Chung and Nation (2004) mentions that Technical vocabulary could be identified by referring to specialists of the subject area and those terms should either only occur in a specialist area or occur with much greater frequency in that area than other areas. The study identified technical words from an anatomy book by using four different methods: implementing a rating scale which ultimately relied on intuition and knowledge of the researcher, verifying if a word appeared in a specialized dictionary, looking for clues in the book (bolding, italicizing, etc.) and using software that performed statistical and form analysis to determine whether a word is technical or not. Both the rating scale method and computational approach were the more reliable, being the latter one the most efficient and practical. Another factor that should be considered is the relation between vocabulary, words and

concepts. For instance, translating successfully a word into the learner's L1 or correctly pronouncing it does not necessarily mean a complete grasp of the concept behind the word. Rusanganwa (2013) defined vocabulary as

... the knowledge of words and their meanings in both oral and print language, and in productive and receptive forms. ... A concept is defined (Reber, 1985, p. 141) as an internal, psychological representation of shared attributes. ... Words are terms and labels used to describe, define, discuss, read about or answer questions about concepts. (p. 37)

When teaching technical vocabulary it is important to make sure students grasp the concept of the words taught so it can be considered that they are increasing their technical vocabulary. Finally, it is necessary to take into consideration students' educational background, as it can affect how fast they learn the target vocabulary. Wanpen et al. (2013) concluded in their study that "... students with the educational backgrounds in vocational stream had higher technical vocabulary proficiencies than students whose educational backgrounds were in the general education stream." (p. 318).

When designing a vocabulary lesson there are many factors that need to be considered, from the learning climate, student's personal circumstances to the actual target vocabulary and methods. An approach that has been suggested beneficial in vocabulary lessons by many studies is the inclusion of digital storytelling which combines the versatility of technology with classic storytelling.

Digital Storytelling

Digital Storytelling (DS) can be defined as the activity of telling stories using any kind of electronic device or digital media in an engaging way. It can be implemented in virtually any electronic device and can take forms such as stories embedded in social media, browser applications, videogames, etc. It differs from traditional storytelling in the sense that DS takes advantage of the technological tool and is capable of offering multimedia resources such as audio, images, animations, videos, among others. Just like traditional storytelling, DS can be used in English language classes in order to improve the language skills of students. Gimeno-Sanz (2015)

researched how motivation and innovation were fostered when using DS with learners of ESP in an Aerospace Engineering career. DS enabled students to be creative and “learn by doing” as well as developing several types of linguistic and non-linguistic skills as it blends a traditional form of communication with current technology. The study also mentions seven elements that help to sustain effective digital stories: Point of View, which refers to how much relatable the story is; Dramatic Question, how much the attention of audience is kept; Emotional Content, evoking emotions; Economy, length of the story; Pacing, if the story is dynamic enough; The Gift of Your Voice, quality of narration and Soundtrack. (p. 111) Digital storytelling is very flexible and can be used in many creative ways; the study of Wu et al. (2008) is a great example. Based on the Total Physical Response Storytelling (TPRS) method, researchers designed a robot that students could use after class to practice vocabulary by imitating the movements of the mentioned robot at the same time they were told short stories, a learning approach which was both educational and entertaining meant to replace memorization of textbooks or transcribing vocabulary; the study mentions that learners feel bored or impatient when simply reading stories, interaction is more effective. Despite the technical complexity of the previous study, Digital Storytelling does not necessarily need to be implemented in complex software or hardware. Razmi et al. (2014) utilized 40 short stories which were administered using Power Point, one of the most popular and accessible presentation software available in the market; the main component in the mentioned study (and the previous mentioned) is the creativity put in the stories written, technology is just a mean to make them more engaging. Razmi et al. (2014) concluded that DS made students more interested in their learning; it also increased students’ motivation and allowed them to be more responsible with their learning process.

Importance of cultural background

An interesting story is always well welcomed when using a DS approach in English teaching. As this is a communicative activity that allows students to reflect and express themselves, there is a great opportunity to go even further by including a cultural component in which they can feel represented. As shown by Skinner and Hagood (2008), DS provides an opportunity for children and adolescents to design

stories that represent their lives and interests at the same time it allows them to reflect on their cultural experiences. The research was grounded in the perspective that literacy is a social practice where students bring their own cultural resources, agendas, and purposes; hence, cultures, contexts, and histories are embedded within literacy learning. Considering the results of the study, choosing, adapting or creating stories with a heavy cultural component, with which the learner can relate to, is desirable as this allows learners not only to improve their language skills, but also reinforce their identity. Furthermore, taking into account the age of the learner, their socio-economic status and many other factors it is possible to tailor content that not only aims to be enjoyable and teach language lessons, but also helps the learner during the stages of their life. Of course, that level of storytelling would require great engagement from the instructor and a considerable amount of time, but the existence of such possibility further consolidates the powerful potential that digital storytelling has to offer in the language teaching field.

The current study focuses on contextualized stories which will be defined as stories or storytelling that has into account the socio-cultural background of the target population. In this particular case, storytelling that incorporates Ecuadorian culture references, familiar places and expressions that are relatable to the students and help them to familiarize with the English language by using their previous cultural knowledge as a stepping stone.

Gamification

Interaction is a key point when using any kind of technological tools, by applying that very same principle in English teaching it is possible to go even further and use technology in a more engaging and informal way that resonates with the learner. Gatautis et al. (2021) comment how Gamification, the use of game elements in situations not related to entertaining, has shown to be effective in increasing engagement, creativity, initiating learning, and even fostering technology adoption. By combining technology, games and applying English teaching methods and language research it is possible to develop applications that help students not only in the classroom but outside of them. In that regard, Yip and Kwan (2006) researched how online games can help students increase their vocabulary learning. During nine weeks, three teachers and 100 engineering students were divided in groups: an experimental

group that learned vocabulary from two carefully selected web sites with games, and a control group which learned the same vocabulary through activity-based lessons. The findings indicated that the experimental group outperformed the control group in the post-test; however, some students reported their preference for combining traditional activity-based lessons with online games. Even though technology can create interesting teaching tools, there is always room for conventional activities that students enjoy. According to this research, a healthy balance between innovation and known methods proved to make students comfortable in their learning process.

Technology can be very versatile as shown in the previous researches; it is possible to use it to develop virtually any kind of method that helps students improve their learning, not only in the language field but in other areas. The level of interaction that can be achieved with technology allows for more complex methodologies that by being combined with gamification engage with students and facilitate their learning process.

CHAPTER III

METHODOLOGY

The current research aims to develop an application that helps A1 Ecuadorian adults-English students learn technical vocabulary about Informatics using storytelling. Four applications following the same software design, interface and algorithm but with different storytelling were developed taking into consideration the target technical vocabulary and data collected from a reading habits and informatics competence survey administered to 53 Ecuadorian adults, annex B shows the survey; each application focused on a specific topic: hardware, software, digital media and internet. During four weeks, one lesson per week, six participants used the mentioned applications (one application was handed out per week) in order to learn technical vocabulary. A virtual meeting about how to use the applications was conducted and tutorial documents were given in order to clarify common questions. After the four weeks, participants' technical vocabulary acquisition was evaluated using a post-treatment test, annex C shows the test. Finally, a user experience survey was conducted in order to gather feedback for future improvement. Annex D shows the survey.

The research described all the steps taken in order to develop the mentioned software, the theoretical fundamentals behind the elaboration of the product and the cultural considerations which influenced its design. At the same time, the product was tested by the participants. The influence of the product on the vocabulary learning process of the participants was measured and conclusions both quantitative and qualitative were drawn. Hence, the research can be classified as a descriptive and experimental one.

Participants

Six Ecuadorian adults aged between 18 and 30 years who graduated from high school participated in the testing of the developed software, 5 women and 1 man. The participants have a lower middle class status and live on the south periphery of Quito, Ecuador. Considering the CEFR levels of English, the participants' level corresponded to the A1 level, more specifically a Pre-A1 level -as defined by Alexiou and Stathopoulou (2021)-. Participants' only contact with the English language was in the

classroom. In addition, most of them had little experience using computers with a few others having zero experience using electronic devices.

Instruments

Literature genre preference and technology competence survey

In order to write the storytelling, qualitative data were collected from 53 Ecuadorian adults using the non-probability snowball sampling, people close to the researcher were asked to send the virtual survey to their acquaintances and ask them to do the same; hence, increasing the number of people involved. Participants were asked about their literature and story genre preferences as well as basic reading habits and their expertise using technology. The survey was conducted in Spanish as this is the native language of most Ecuadorians.

The first section aimed to determine which kind of stories were more suited for Ecuadorian people, it collected information about the participants' frequency of reading, preferred genre (both in written or multimedia forms) as well as opinions on reading, the importance of reading books in English as a mean of learning the language and which kind of traits they considered most important when writing a storybook aimed to Ecuadorian people, the question included typical items that can be found in many English and non-English textbooks as well as which type of cultural references may be preferred. The section was mostly qualitative and was coded in order to be interpreted accordingly.

The second section aimed to collect information about the general knowledge Ecuadorian people have on Informatics as well as the type of electronic devices they use in their daily lives, this section was mainly composed by rating scale and multiple choice questions that were easily categorized.

Interactive Software

It consisted in four applications based on the model of a visual novel videogame, a popular genre of videogames in which the player, in this particular case the learner, takes the role of the main character who is given the ability to interact with the world and choosing their own path; affecting how the story progresses. The plot and

characters were designed in order to include the technical vocabulary intended to be learned as well as to be relatable to Ecuadorian young adults.

Each weekly lesson introduced one application which included around ten vocabulary terms related to a specific informatics topic. The vocabulary was adapted from the Informatics curriculum currently taught at the private center in Quito where the research takes effect.

Concerning the developing of software, it follows the structure of a Visual novel game: A text box at the bottom of the screen displays the character and narrator dialogues; behind the text box, dynamic illustrations of the main characters are shown, these images can change accordingly in order to show different emotions and poses. Additionally, there are several layers which can be used as a background or foreground depending on the needs of the story. The learner will be in charge of making the story progress by clicking on the screen; this action updates both the text box and the characters' images. Faizal (2016) comments that "Visual Novel games commonly comprise of plots and offer various endings based on the reactions of the player toward the conversational game in it."(p. 482) Following this statement, once in a while, the learner will have to make choices or answer some questions; depending on the chosen answer, the story may be affected and different endings may appear provided the necessary conditions are met. This feature aims to encourage learners to replay the game in order to see all the possible endings and variations in the story; thus, increasing the exposure of the learners to the target vocabulary. Annex A. shows screenshots of the main parts of the developed software.

Post-test

In order to determine the impact of the developed interactive software, a post-test was conducted which was adapted from the one conducted by Wanpen et al. (2013, p.316), the test included three parts: (a) matching vocabulary with their functions, (b) completion the blanks by using suitable words, and (c) multiple choices questions after seeing pictures of the vocabulary. This model was chosen due to its relatively high reliability which according to Wanpen (2013) was 0.91 after it was piloted; also, both Wanpen's research and the current study focus on technological vocabulary learning

which makes the test easy to adapt. The final score of the post-test was analyzed and contrasted with the background of the participants.

User experience survey

Due to the very limited amount of participants, a more qualitative approach was emphasized. For that reason, a survey which evaluates the application user experience when using the developed software was conducted. General numerical rating and open questions regarding accessibility, fun, benefits and learners' opinion were asked in order to gather feedback for assessing the application and future improvement. This information was used to draw the final conclusions of the research.

Data collection

The literature genre preference and technology competence survey was handed out using Google Forms. The researcher asked relatives and friends to answer it and spread it among their acquaintances, the survey remained open to answer for about 3 days; 53 people participated at the end of this period.

The post-test as well as the user experience survey were conducted one week after the fourth and final application was given; both the post-test and survey were held in a physical classroom; thus, ensuring no cheating occurred; there was no time limit to do these activities.

Data analysis

The surveys were composed mostly by open and rating questions. The answers from the open questions were sorted out in categories and then it was determined which categories have the higher frequency. This allowed the researcher to draw conclusions more effectively and perform a qualitative analysis. It is important to notice that due to the very limited number of participants in the end user experience survey, the qualitative analysis of the open questions consisted on comparing participants' remarks and highlight common and punctual criticisms. The answers from rating questions were fairly easy to categorize and sort out; its interpretation and analysis was straightforward.

The surveys also included some multiple choice questions which in a similar manner as the rating questions, their answers were easily organized and interpreted.

Concerning the post-test, as it was mainly composed by multiple choice questions. The grading did not present difficulty and allowed a very fast and straightforward analysis.

Treatment/intervention

The treatment consisted in the participants interacting and playing with the software with little to no intervention from the researcher aside from basic explanations about how the software works and how to interact with it. The software was delivered using a link of Google Drive; the participants were instructed to download, install and use the software in his personal computer or smartphone, Windows and Android versions were developed as those platforms are the most popular ones. The applications were designed to be completed by an A1 English student in an estimate time of two hours (this estimation does not take into account replaying). It is worth noting that this time may vary depending on the students' personal conditions. The participants were encouraged to replay the game in order to get different dialogues from the characters and endings. This led to more exposure of the target vocabulary.

Limitations

The design of the current study is subject to limitations. For instance, there were only six participants who received the treatment. This means that generalization of results was not possible. Regarding implementation limitations, during the treatment some difficulties in the installation of the applications appeared. This might have been due to the lack of technological expertise of the participants. In addition, the level of English of the participants prevented some of them to fully understand the stories and lead to some frustration. Other limitations included establishing the exact time spent by the participants in learning the technical vocabulary. Even though the participants were asked directly how much time they spent on the application their answers were a rough estimate.

Implications and contribution to knowledge

This study is relevant as it presents an innovative approach that take the most of current technology in order to develop software that help young adult English beginner students to increase their vocabulary through interactive and compelling stories that present technical vocabulary in context. By avoiding traditional and sometimes tiring methods of learning vocabulary such as long lists of words to be memorized, students were able to see how vocabulary is actually used in context. In consequence, they not only learned the target technical vocabulary but also used their reading skills in order to comprehend the real meaning of the stories.

One of the objectives of the study was to develop software that could be access anywhere at any time; hence, accessibility was a great concern during the developing process. Students with basic technological skills should be able to install and use the provided software with minimum effort; on the other hand, students with no technological skills would be provided with detailed instructions that can help them to install and use the developed software. In any case, the possibility of using the developed software gives students the opportunity to foster their skills on their own. Provided the storytelling and interaction catch the attention of the learners, they will start to become responsible for their own language learning.

Teachers can greatly benefit from this research as it provides an easy to modify software that can help them develop more complex or simpler educational tools. Different language skills can be the main focus, different types of vocabulary or using specific target grammar structures are some of the possibilities that teachers can incorporate in the text or audio of their own stories. Also, taking into account the cultural background and personal factors of the students it is possible to reach different demographics as well as create tailored content that learners really like and consequently increase their motivation to learn a foreign language. Teachers should be able to use this research effectively in order to create innovative teaching techniques using the current technology.

The findings of this study may help to understand the point of view of students regarding the implementation of new language teaching approaches. Observing and measuring how they feel about these set of new resources, favorable and unfavorable

responses as well as their levels of motivation provide feedback that can help future research to polish the resources that were created and most importantly what approaches fosters student's interest on language learning. One interesting point to consider in this study is the combination of two subjects that typically are considered challenging in the Ecuadorian educational system, English and informatics; it is expected that some students may feel overwhelmed by the amount of new information given in a foreign language; however, measures were taken in order to develop a product that ensures students feel comfortable while they are learning; of course, learners opinions and measured data would determine how successful the product was.

The findings of this study might be helpful for future and bolder attempts to integrate technology with different disciplines of language teaching. The capabilities of software development are far beyond what was explored in this study. The integration of audio files and even artificial intelligence can boost the skills that the developed software aimed to improve. Furthermore, different types of technical vocabulary, general vocabulary, grammar structures and many others can be implemented in order to develop a complete curriculum of English course through storytelling.

One of the main problems that some students face when learning a foreign language, especially English, is that they do not feel represented in the available resources. Students may benefit from stories that does not rely exclusively in the perspective of the United States or The United Kingdom, but that were designed by people that are part of the learner culture and is able to transmit that knowledge using English as a tool for expanding our own culture.

CHAPTER IV DATA ANALYSIS

Literature genre preference and technology competence survey

The survey was conducted virtually using Google forms; due to the lack of access to a representative population of adult language students, the researcher asked relatives and friends to answer and spread the survey among their acquaintances. This has led to an unavoidable bias in the results as 75% of the participants have or are studying an engineering degree. In any case, 53 adult Ecuadorians answered the survey, 41 men and 12 women.

When asked “What does reading mean for you?” 90.6% of the participants agreed that it is an activity that allows people to learn and expand their knowledge, 13.2% of the participants considered reading as a hobby. Regarding which story types they preferred the top three genres were: romantic, scientific and historical stories. Figure 1. shows how much frequent participants read storybooks, being 0 never and 5 very frequently.

¿Qué tan seguido lee libros de relatos o historias?

53 respuestas

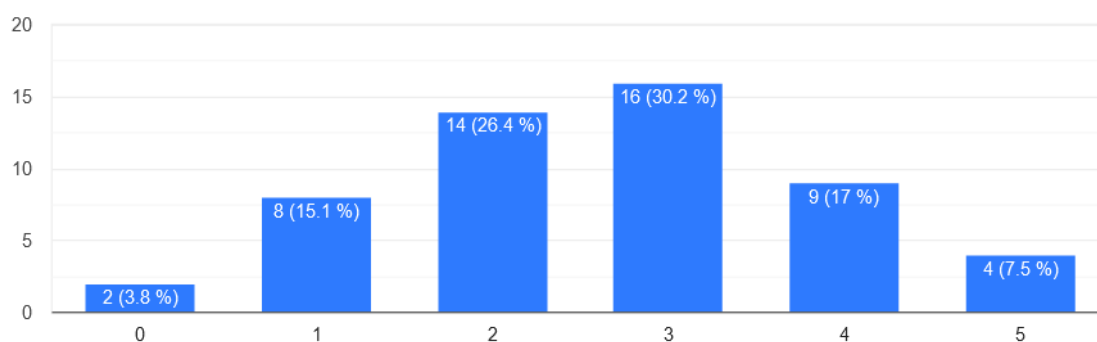


Figure 1. Frequency of Reading

When asked “Which characteristics do you consider the most important for a storybook aimed to teach English vocabulary to Ecuadorians?” the top three options were: interesting topics, Illustrations and reading comprehension questions. This answers heavily influenced the design of the software. Figure 2. shows the chart.

¿Qué características considera son las más importantes que un libro de relatos/historias para aprender vocabulario inglés dirigido a Ecuatorianos debería contener?

53 respuestas

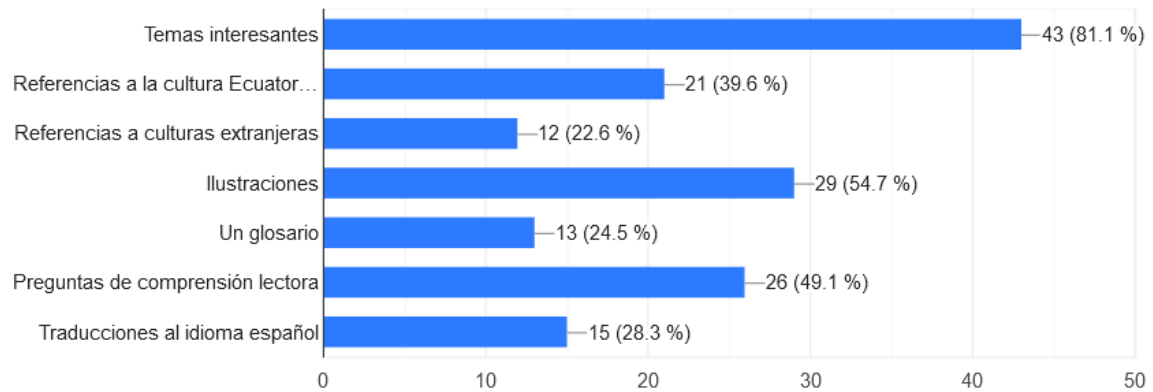


Figure 2. Desirable characteristics of the storytelling.

Concerning the second part of the survey, most of the participants were not confident in their Informatics skills; they acknowledged having moderate or even low technological skills. On the other hand, those who claimed to have good technological skills reported having used operative systems and software applications in English at least once. Regarding the availability and usage of electronic devices, both Windows personal computers and Android smartphones were the most commonly used and available. This information was used in order to choose the platform in which the software is available. Figure 3 & 4. illustrate these data.

¿Qué tanto conocimiento tiene de Informática?



53 respuestas

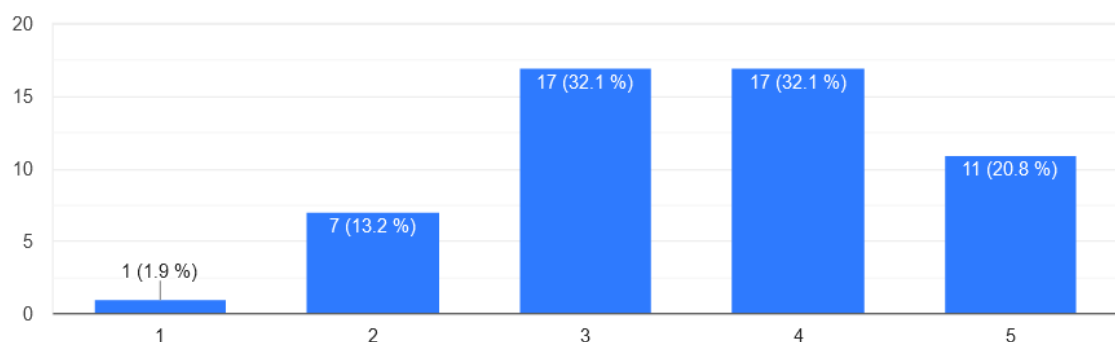


Figure 3. Informatics knowledge. (1 little, 5 a lot)

Seleccione los dispositivos electrónicos que tenga total disponibilidad en su hogar.

53 respuestas

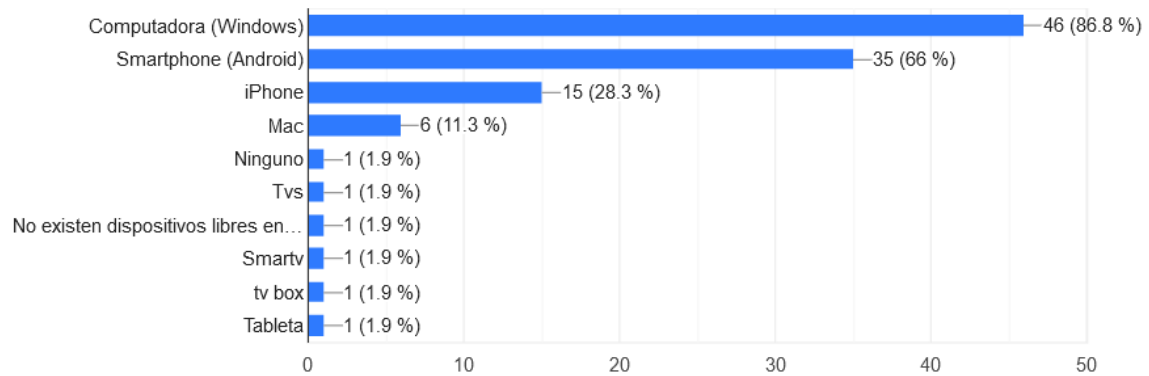


Figure 4. Electronic devices availability.

Analysis and interpretation

It is worth to noting that most of the participants involved had or are studying an engineering degree. Hence, these results cannot be generalized for the entire population. Nevertheless, the information collected provides an insight on how a particular group of Ecuadorian feels towards the use of storybooks in the learning of English. Even though some participants (18.9%) reported not reading frequently, the vast majority (90.6%) recognized the importance of reading as a tool for expanding their knowledge. It is important to point out that the participants considered that the cultural background of the story should be focused from an Ecuadorian perspective; this is an interesting shift from the classic English storytelling where most of the stories are from the American or British perspective. In addition, the use of images and feedback questions were also appreciated. As expected, participants agreed that the most important point was that the story be interesting. In fact, if the storytelling fails to catch the learner's attention there will not be any learning process. This information was taken into account when writing the storytelling. Regarding Informatics competence, the results were as expected and confirmed that people are not usually interested in this field, but have a little grasp of technological skills, mostly due to their necessity of using electronic devices in their

work and study places. Finally, the most popular platforms that are used in the country are Windows personal computers and Android smartphones. This data determined the platforms where the developed software is available and helped to choose the target technical vocabulary.

After conducting the Literature genre preference and technology competence survey, the data was analyzed and codified in order to develop the interactive software applications, 4 applications which shared the same graphical interface and algorithm but offered different stories that focused in different target technical vocabulary. The writing process took into account the level of English of the student and avoided, as much as it was possible, complex grammar structures and difficult vocabulary that may prevent understanding from the learners. Each application included review questions and choices that the player can choose and change the course of the story.

Once the applications were developed, some test of compatibility with the target electronic devices was performed. After it was determined that the four applications run correctly in Windows personal computers and Android smartphones, the applications were handed out to the students using a Google Drive link; some instructions and a virtual session about how to install and use the software were also implemented.

During four weeks, students interacted with the developed applications (one application was handed per week). One week after the final application was delivered, students took a post treatment test and a user experience survey in order to determine how much technical vocabulary they acquired and their opinions regarding interactive software applications.

Post-Test

The post treatment test was an adaptation from the test conducted by Wanpen et al. (2013, p.316). It consisted in three sections:

- (a) Multiple choices questions after seeing pictures of the vocabulary.
- (b) Matching vocabulary with their functions.
- (c) Completion of blanks by using suitable words.

Multiple choices questions after seeing pictures of the vocabulary.

The first section consisted in twelve multiple choice questions which evaluated the learner's ability to identify hardware components; each question presented an image of a piece of hardware and four options from which the students should choose the correct one. Table 1. shows the score from all the participants in this section.

Table 1. Post-test First Section Scores

	Matching Images (12)
Student A	8
Student B	8
Student C	12
Student D	10
Student E	10
Student F	6
Average	9.00
Percentage	75.00

The results shows that participants did a good job in this section. One participant answered correctly all the questions and the rest did a fairly good job. When averaging the scores, a 75% of success was achieved by the group which indicates that they recognized most of the hardware components presented in the test.

Matching vocabulary with their functions.

The second section consisted in twelve questions where the concepts and functions of different software, internet, digital media and hardware terms where asked. The participants should choose the most suitable answer among four options. This section did not present any image or visual clue that could help students; hence, the learner comprehension of the language was crucial in order to correctly answer the questions. Table 2. shows the score from all the participants in this section.

Table 2. Post-test Second Section Scores

	Matching Functions (12)
Student A	3
Student B	6
Student C	9
Student D	9
Student E	4
Student F	7
Average	6.33
Percentage	52.78

The results shows an increasing difficulty for participants when answering the questions. Some of them did a good job, but others dropped their previous score significantly. When averaging the scores, a 52.78% of success was achieved by the group which indicates that they had trouble identifying the vocabulary and the concepts associated with it.

Completion of blanks by using suitable words.

The third section consisted in sixteen questions where concepts and functions of different software, internet, digital media and hardware terms where asked. The participants should choose the correct word that completed the main idea of the provided sentence. In a similar manner than the previous section, this section did not present any image or visual clue that could help students; hence, the learner comprehension of the actual meaning of the words that would complete the main idea was crucial in order to correctly answer the questions. Table 3. shows the score from all the participants in this section.

Table 3. Post-test Third Section Scores

	Completion of blanks (16)
Student A	5
Student B	9
Student C	13
Student D	12
Student E	8
Student F	5
Average	8.67
Percentage	54.17

The results shows a similar performance when compared to the second section. Some of the participants performed better, but others dropped their previous score a little bit. When averaging the scores, a 54.17% of success was achieved by the group, a slighty improvement yet not significant which indicates that they had trouble identifying the vocabulary and the concepts asociated with it.

Analysis and interpretation

The six participants obtained different results in the three sections; reportedly, when averaging the scores it is possible to see that the first section was better answered, followed by the third and second section which have similar scores. This result was expected as the first section is about matching images, it involves a clear image of the physical object and a word, there is no need for the learner to rely in their L1 as the concept is clear and can be appreciated with their senses. The contrary occurs with the second and third sections. In average the score achieved by the participants in these sections is fairly similar, this can be due to the absence of images or any sensorial stimulus that help the learner to choose the correct answer. These sections rely exclusively in the ability of the learner to understand basic English and its expertise not only with the technical vocabulary but also involves the learner's general knowledge of the language. It is worth noting that due to the fact that the test does not include open questions, it is difficult to determine if more skills apart from reading comprehension were developed. Table 4. shows the results.

Table 4. Participants Score

	Matching Images (12)	Matching Functions (12)	Completion of blanks (16)	Total	Percentage
Student A	8	3	5	16	40
Student B	8	6	9	23	57.5
Student C	12	9	13	34	85
Student D	10	9	12	31	77.5
Student E	10	4	8	22	55
Student F	6	7	5	18	45
Average	9.00	6.33	8.67	24.00	60.00
Percentage	75.00	52.78	54.17		

Due to the low number of participants it is not possible to generalize these results. It is important to notice the results were entirely achieved by the students with little help from the instructor. It is important to compare this results with the survey experience in order to discover which factor may have affected students performance, as it can be seen; some students achieve high scores whereas others did not.

User experience survey

After the treatment, a user experience survey was conducted with the participants, 6 adult Ecuadorians from 18 to 30 years old answered, 1 man and 5 women. The main objective of the survey was to determine how accessible, fun and educational the developed software was as well as to gather feedback for further improvement. The first set of questions consisted in general aspects of the developed applications, there was a mixed reaction about the entertaining value of the written stories, most of the participants believed that the stories were a little entertaining. When asked about the intuitiveness of the software, most of the participants seemed to have problems using the application. This may be the case due to the little expertise the participants had with electronic devices; on top of that, the applications' menu and options were entirely in English which may have complicated its configuration and navigation. Finally, when asked about replayability, most of the participants answered that the software is replayable; two participants really believed the applications were highly replayable. These results were expected as each story has different endings and extra dialogues depending on the decisions the learner makes.

According to these results, the overall design of the software can be improved to be more accessible to new users. Regarding the writing of the storytelling, it seems participants were not completely engaged; there may be several reasons such as: genre of the story, limited vocabulary and grammar which limited the range of expression of the characters and many more; a good approach to solve this observation might be to tailor content for the specific learners. Finally, it seems that the structure of a visual novel achieves the goal of replayability as the learners realized how their choices affected the story; hence, they can spend more time learning the target vocabulary. Figures 5, 6 and 7 show the results.



Figure 5. How entertaining were the stories? (1 little, 5 a lot)

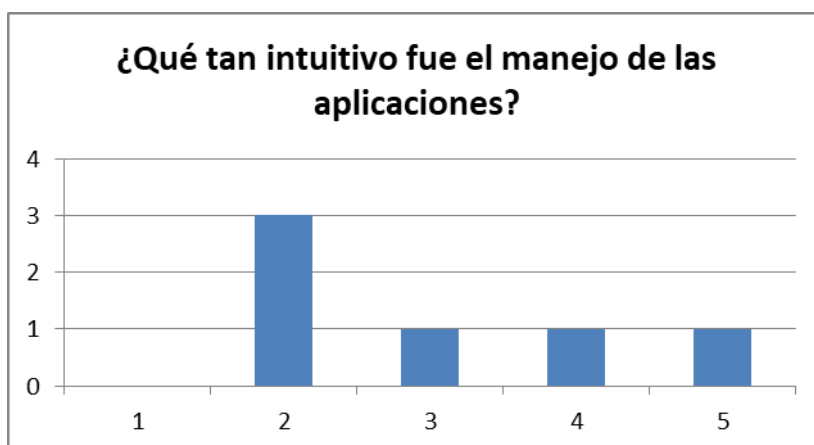


Figure 6. How intuitive was the use of the applications? (1 little, 5 a lot)

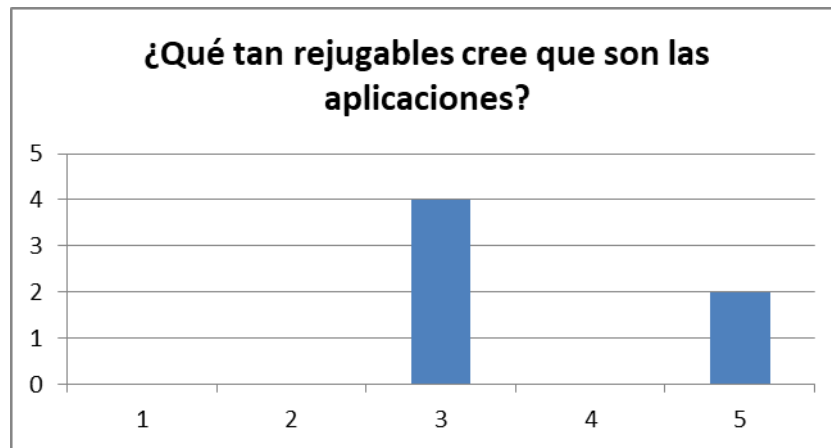


Figure 7. How replayable were the applications? (1 little, 5 a lot)

The following questions aimed at finding out how participants felt about the purpose of the developed application as well as their reading English proficiency after taking the treatment. Most of the participants believed that the developed applications combined with storytelling were useful for learning technical vocabulary; two participants were not sure about this statement. After that, participants were asked about what they have learned, one participant reported they have learned nothing at all; whereas, the rest of the participants reported they learned general English and technical vocabulary in a fair amount. The most surprising fact was that most of the participants felt their reading skills in English increased moderately. These results were expected as there was a lot of text in the developed applications. Figures 8, 9 and 10. shows the results.

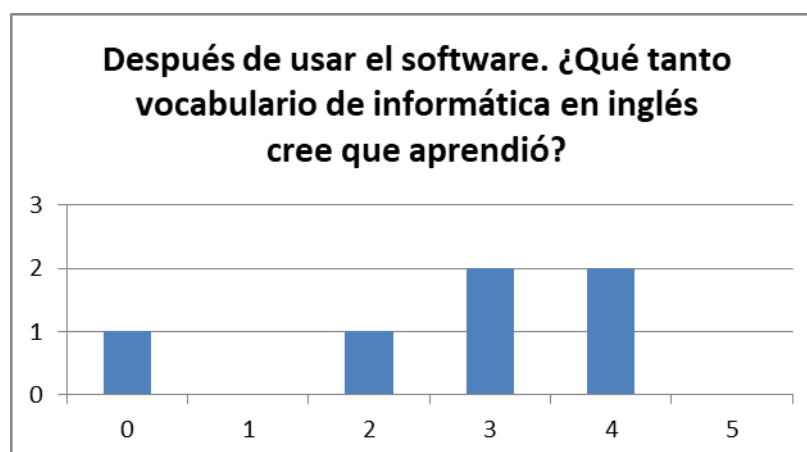


Figure 8. How much Informatics vocabulary did you learn? (0 none, 5 a lot)

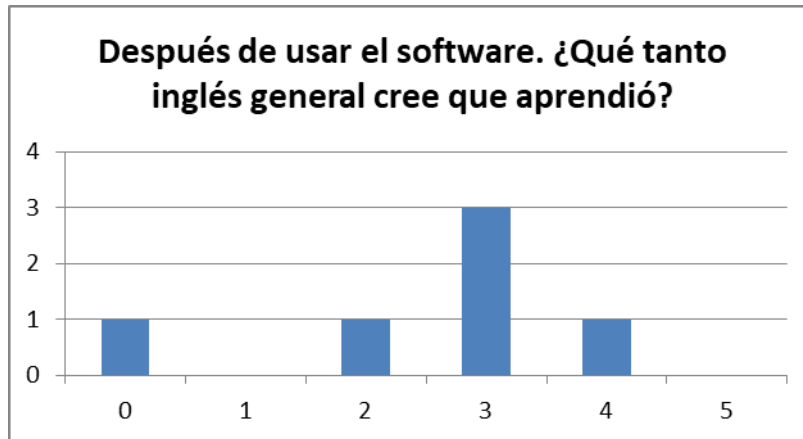


Figure 9. How much general English did you learn? (0 none, 5 a lot)

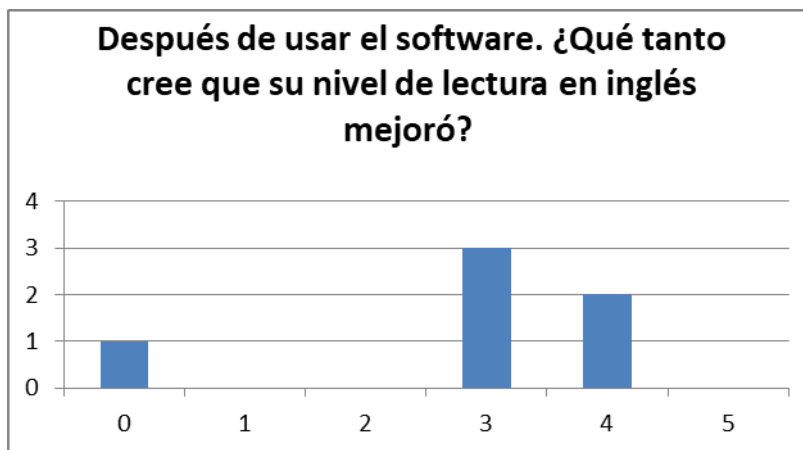


Figure 10. How much did your reading skills improve? (0 none, 5 a lot)

After the rating questions, qualitative questions were asked. The first one asked how much time the participant spent in the application. The time spent greatly varies from half hour a day to four hours once a week. As the applications can be used at any time and no timer was implemented in the software design it is not possible to determine the exact amount; however, it is interesting to notice that those participants who reported having invested more time in the application achieved greater scores. Some participants mentioned that the story was entertaining; they enjoyed the interaction between the characters and how the technical vocabulary was used in the plot. The animations and graphical design together with the questions and answers were also well received. Despite these encouraging answers, few participants reported having replayed the applications. Regarding the storytelling, there were mixed opinion about which story was better or not so better. However, there are some patterns that

participants found enjoyable during the treatment, the inclusion of Ecuadorian references to places, famous people and culture was well received and all participants agreed this was a nice touch. A common complaint about how the stories were written was that they felt empty and redundant sometimes. Another common complaint was the difficulty in the installation of the applications. Some participants reported problems with the music; those problems were expected and during the development of the software several debugging sessions were implemented. However, due to limitations in the schedule of the researcher and little expertise of the participants using technology some of these problems could not be solved entirely. Finally, one participant remarked that mixing two subjects such as English and Informatics made the learning process harder and discouraged this person.

When asked for suggestions, participants mentioned the addition of more immersive features such as the use of voices for each character, choosing characters as the main protagonist, a better mix of the music, more questions and shorter stories that go directly to the point. The implementation of these features is completely possible; however, each feature would require a substantial amount of time to be developed.

Discussion

The results showed that a portion of Ecuadorian people consider that reading is beneficial when learning English in general which corresponds to the researches made by Oxford and Scarcella (1999) as well as Tai and Khabbzbashi (2019) where they suggest that presenting vocabulary in context improves learning. In addition, romantic, scientific and historical stories are preferred by this population; they also consider that the inclusion of comprehension questions, illustration and an interesting narrative contributes to enhance learning. Those mentioned points can be traced back to the art storytelling and are also mentioned in the research of Gimeno-Sanz (2015) which emphasizes the role of creating and delivering the story.

Concerning Informatics competence, the respondents have mixed levels of knowledge of Informatics; even though most of the participants studied or are studying in college, half of the participants reported having middle to low levels of Informatics. Interestingly, the great majority of the participants have electronic devices in their

homes. This suggests that at least half of this population uses the bare minimum capacities of their electronic devices, possibly only for their jobs.

Taking into account the former data, the proposed interactive software was designed; it was divided in four applications that focused in a specific topic of Informatics and presented a story which included the technical vocabulary to be learned. Six participants used the applications during one month; each application was handed out to the participants every week. Once how the software works was explained, most of the participants were able to finish the games alone, some of them replayed them and choose different options in order to see dialogues and endings not present in his first walkthrough. This behavior correspond with the research of Wu et al. (2008) which stated that interaction is a key point when developing educational software as this encourages students to be involved in their own learning at the same time they are enjoying the activity. As Gatautis et al. (2021) suggested Gamification increase the engagement of participants. The intrinsic motivation some participants shown when replaying the game resembles the results from Gimeno-Sanz (2015) where participants' motivation was increased after using storytelling in an ESP class in an Aerospace Engineering career.

One week after the final application was handed out, the participants answered a test which evaluated their knowledge of the technical vocabulary intended to be learned from the software application. According to Rusanganwa (2013), the relation between vocabulary, words and concepts is important to distinct in order to truly evaluate the participant's knowledge. Hence, the conducted test included three sections which evaluated those aspects; the test was adapted from Wanpen et al (2013) which also suggested that the educational background has effect in participants' ability to learn technical vocabulary. In fact, this seems to be congruent with the results; participants who had informatics knowledge background in Spanish scored better than those who did not. It is worth noting that the average score of the participants was significantly higher in the first section which only required learners to match images with its correspondent written word. Both the second and third did not include any kind of visual clue, were entirely text-based; hence, in order to answer correctly English background knowledge was required. The participants reported they felt they learned technical vocabulary from the storytelling, yet the learning process was not entirely satisfactory as most of the

participant achieved a medium score. However, the participants also reported that they felt the application helped them more acquiring general English than the target vocabulary. This may be due to the constant exposure to the language in order to convey the technical vocabulary as well as to tell a story. In any case, the acquisition of language is welcomed and also corroborates results from many studies that suggest storytelling is a valid tool for improving language skills.

After the treatment, an experience survey also was conducted. One of the main criticisms from the participants was that difficulty of installation of the applications. Once those problems were solved, participants reported that the usage of the application is a little confusing at the beginning. Another major criticism is that the idea of mixing two subjects such as English and Informatics makes the learning process harder and discourages the learner. The participants reported that more interactive features may enhance the experience. In fact, this is a valid criticism as more interaction has been proved to be crucial in developing games and educational software. However, in the case of adding features, it is necessary to make sure those features contribute to the main goal of the research which is exposing learners to the technical vocabulary and catch their attention so they can remember and identify that vocabulary in the long term. The participants enjoyed the different stories, how the characters interacted among each other and specially the references to the Ecuadorian culture.

It is worth noting that due to the hierarchical relation between the researcher and the participants some of the answers provided in the user experience survey may not be completely reflect reality. Future research using the proposed approach should be very careful when selecting the participants in order to avoid possible bias.

The role of technology during this experiment has to be mentioned; due to the current sanitary situation, there was no personal interaction with any of the participants during the treatment. An exception was made in the post-test and user experience survey in order to avoid cheating and get the most honest answers. Thanks to the different electronic devices, services and platforms available in the digital market, the collection of data as well as the administering of the treatment were done in a fast and organized manner. The administration of the surveys and treatment demonstrates the advantages of using interactive software as an educational tool; it can be widely distributed to virtually

any place and with relatively low costs provided the participants have the required hardware.

The current results suggest that combining storytelling and interactive software has great benefits in learners such as increasing their motivation and also fostering self-learning. The inclusion of different branches of language learning has contributed successfully to developing a functional product that can be implemented as a complementary tool for improving technical vocabulary and also general English. The current approach focused in reading as the language skill to be developed, but it is possible to modify the software to include dialogues with audio which can lead to a similar research with listening as the language skill to be improved. In the same manner by incorporating more complex algorithms it is possible to develop software that can recognize texts and audio inputs; hence, writing and speaking can also be improved in a similar way. For that reason, it is encouraged to foster cooperation between different departments in order to develop more complex and interesting projects. The present project focused on English vocabulary for Informatics; however, further research using different subjects such as: medicine, business, tourism, as well as focusing on specific grammar structures or semantic competence in general English is heavily encouraged.

CHAPTER V PROPOSAL PRESENTATION

Pedagogical Design

One of the main problems beginner English students face when trying to use the language is their lack of vocabulary, even when students have mastered many grammatical structures their limited vocabulary prevent them from engaging in a meaningful conversation, listening to a lecture, writing or even reading a piece of text. Current Ecuadorian English classes have a clear main focus on grammar and do not give students the necessary skills in order to increase their vocabulary by themselves.

This research main objective is to design interactive software that includes storytelling that helps young Ecuadorian adults between 18 and 30 years old learn specific vocabulary regarding Informatics and as a side effect practice their reading skills and also obtain general vocabulary. Several aspects were taken into account when developing the mentioned software such as how adults learn vocabulary, which involved creating a good learning climate, using adequate social and educational techniques and understanding the differences between the mental process of an adult and a child; the writing of the story, which was based on the results of the literature genre preference survey conducted at the beginning of the research; the chosen vocabulary, adapted from the Informatics curriculum of the institute where the research took place using ESP criteria such as the student's needs and the level of English of the student; the interface and algorithm that governs the application, which based on the principles of gamification resembles a novel visual videogame.

In order to incorporate the current approach into the English classroom, the following lesson planning was designed in order to achieve the best results.

Pedagogical Activities

The study introduced four lessons with its respective topic and application. Each application was developed using the same engine, Ren'Py; an open source and free for commercial use visual novel engine based on Python (*The Ren'Py Visual Novel Engine*, n.d.). These applications aimed to be used both inside and outside the classroom. As this resource can be used at any time and any place it does not need internet connection and

works in low spec electronic devices. The grammar and vocabulary used in the storytelling are easy to understand and were selected using the criteria of the CEFR A1 level guidelines; however, the instructor should have at least a considerable amount of knowledge of informatics in order to answer any doubt students may have about the story and concepts presented during the walkthrough of the developed software.

As this approach mixes two different subjects such as English and Informatics, it is very important to organize the classes which will use this software in a way that does not look intimidating, but as an opportunity for students to test their reading skills in order to actually acquire specific knowledge that goes beyond the general English curriculum they are used to learn and even apply it in their lives, provided they have the opportunity to do so.

Students do not necessarily need to have prior knowledge of informatics before taking these lessons as they are explained from the beginning and are designed for people who are not entirely familiar with the use of computers, internet and common electronic devices presented in Informatics. In order to implement the following lesson plan in any regular educational institute it is very important to have the cooperation between the English and Informatics departments as well as the authorization of a cross-curriculum lesson plan from the authorities.

Software Design

The development of the software contemplated many phases which went from planning, data collection, storytelling writing, assets creation (images, music, etc), scripting and compiling.

The first stage of the process consisted on determining the target audience's story preferences. In order to do so, a survey about genre preferences and some examples of stories that the target audience read helped to determine a suitable storytelling. After determining the type of story, it was necessary to select the target vocabulary to be taught. Considering basic ESP guideline, it is important to consider the learner needs. What they need to know and what is useful for them. In that regard, the current project took the vocabulary from the most common words that are taught in a regular Informatics course.

The next step was writing the story integrating the target vocabulary as well as taking into account the English level of the student. Also, the skill(s) that were going to be focus of the experiment; in this particular case, reading was the skill to be developed.

As the current project aimed to develop interactive software that incorporates storytelling, it was concluded that the structure of a visual novel videogame perfectly matched the goals of the project as it is easy to program (due to the utilization of Renpy, an open source visual novel game engine based on python), to modify and to add a great amount of text that can be accompanied by illustrations, sound effects and animations. Consequently, the next step consisted in the elaboration of the different assets that were be included in the interactive videogame; for instance, as the story, characters and settings were already described in the story script. It was necessary to represent those environments as well as design the actual appearance of the characters. In order to do so; Krita, an open source graphic illustration software, was used. A typical visual novel character consists on basic sprites that are superposed together in order to convey the illusion of a full character with customizable expression and poses. The range of expression of a character depends on the number of available sprites. Regarding the locations where the story is going through, there are many options such as drawing and painting landscapes; however, this process is time consuming. Instead there is an easiest and faster method which consists on using photography from real life places and apply digital filters so they fits with the artistic aesthetic of the characters.

Finally, the music ambience would require even more expertise to be made from zero. Consequently, the current project opted for choosing different songs that are already in the market. Copyright issues should be considered when opting for this approach. In this particular case, such consideration was not taken as the project would not be publicly released on electronic stores nor it will be used to profit.

In any case, pretty much all the content that was used in the visual novel videogame is original with exception of some backgrounds and the music utilized. It is worth mention that there are many features that Ren'Py is capable of such as: adding visual and sonorous clues, voice acting and many more. The implementation and creation of these features may have significantly increased the time of development.

The next step consisted in coding the software itself. Ren'Py uses a script file that controls the sounds and images of the game. This script is divided in two sections: the header and the story section. The first one defines the number of characters, their names and combination of sprites that will make the character show emotion, some shortcuts that will help to locate the characters in the screen and some variables that will register the player's choices and consequently act as trigger of different scenes and ending when necessary. The story section consist in basic scripts that specify the character name, its dialogue, expression and location in order to build the scene and progress the story; this section also contains questions events that according to the player choices and variables will lead to different story routes.

Once the scripting was finished, the final step consisted in compiling and distributing the developed software; Ren'Py is able to compile games for Windows and android devices. The process takes a few minutes and depending on the platform the game may be a single file or a folder. The installation process is fairly easy for users with experience using computer, but students may find it a little complicated; hence, the importance of tutorial documents when distributing the files. A link of Google Drive was used for such task. Annex E shows the tutorial document.

Activities

The current proposal consists in four lessons, each one with a fairly similar structure: A warm up which objective is to activate previous knowledge from the student, this section lasts around 5 to 10 minutes. The following section is the implementation of the developed software which is divided in 3 sets of 30 minutes and 2 breaks of 5 minutes. During this section, the student can use any resource they consider necessary in order to understand the story as well as to ask their instructor or classmates. Finally, the last section consists in a wrap up of what was learned, it lasts around 5 to 10 minutes. See Annex F. for a full description of the planned lessons.

Evaluation

Formative Assessment: The game itself provides feedback when selecting an answer. A correct answer will deliver a message that will acknowledge the selected choice and provide some extra details about the topic. In the case a wrong answer is

selected, the game will provide immediate correction and, if applicable, a statement which explains the possible causes of confusion when selecting the wrong answer instead of the right one.

Summative Assessment: Once the student finishes the game, a numerical score will be displayed in the dialogue box. This score influences the type of ending the player gets. Some stories will also vary their dialogues and endings depending on other factors that are not exclusively dependent on the answered questions.

CONCLUSIONS

Considering the results, there is great potential in developing software with educational purposes, not only in learning languages but virtually in any kind of educational subject. Combining storytelling and software interaction has proven to be effective as it increases the learners' motivation and fosters self-learning. When designing this kind of software, it is important to consider many factors such as: the target population, their language level, their educational and cultural background, reading habits and genre preferences as well as the intended skills to be taught. The learners' needs have to be identified before designing the software in order to meet them accordingly. Also, there must be a strict control of quality before deploying the product in order to prevent errors in the programming and unintended behavior in the application. A big emphasis in the role of interaction as well as the storytelling must be given; the software must provide enjoyable activities that reinforce the knowledge learned. These activities must be non-intrusive and coherent with the flow of the story. The target vocabulary should be the core of the story and all the activities and narrative elements must be designed taking that content into consideration. If there is any possibility to add new features to the developed software, it is very important to design them having in mind the main goal of the product which is helping learners to acquire technical vocabulary; otherwise, those features may result in distractors that disrupt the learning process. Finally, in order to successfully evaluate the acquisition of technical vocabulary of the learners it is necessary to identify the relation between vocabulary, words and concepts in order to design a test that truly measures this knowledge. The current research can be adapted to be applied in different fields as well as to improve different language skills provided the research team has the expertise to design more complex software.

RECOMMENDATIONS

It is very important to make sure the developed software runs correctly in the device the students will be using. Any bug or non-intended operation should be fixed as soon as possible.

It is very important to double check grammar and spelling when writing the story as this may lead to confusion. Piloting the developed software with people who are proficient in English is highly recommended.

The length of the story should be long enough to keep student's attention and expose them to the target vocabulary. Measuring how much time students take to finish the story can help tuning the duration of the game.

Making sure all students have similar levels of English before using the software prevents some students to feel discourage when using the software due to their lack of understanding.

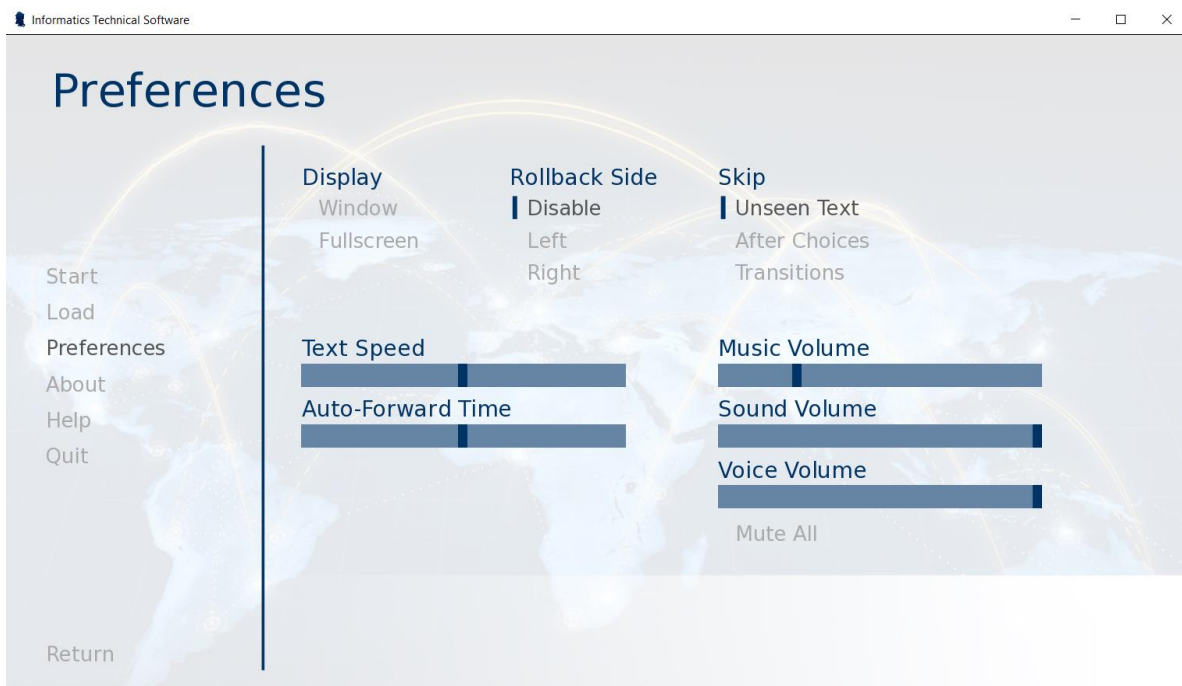
Further research can include many improvements such as animated sprites, dynamic backgrounds that enhance the playing experience. Other language skills can be developed; for instance, by incorporating audio files in the dialogue. It is possible to develop listening skills in the students. Ren'py is capable of all the mentioned features.

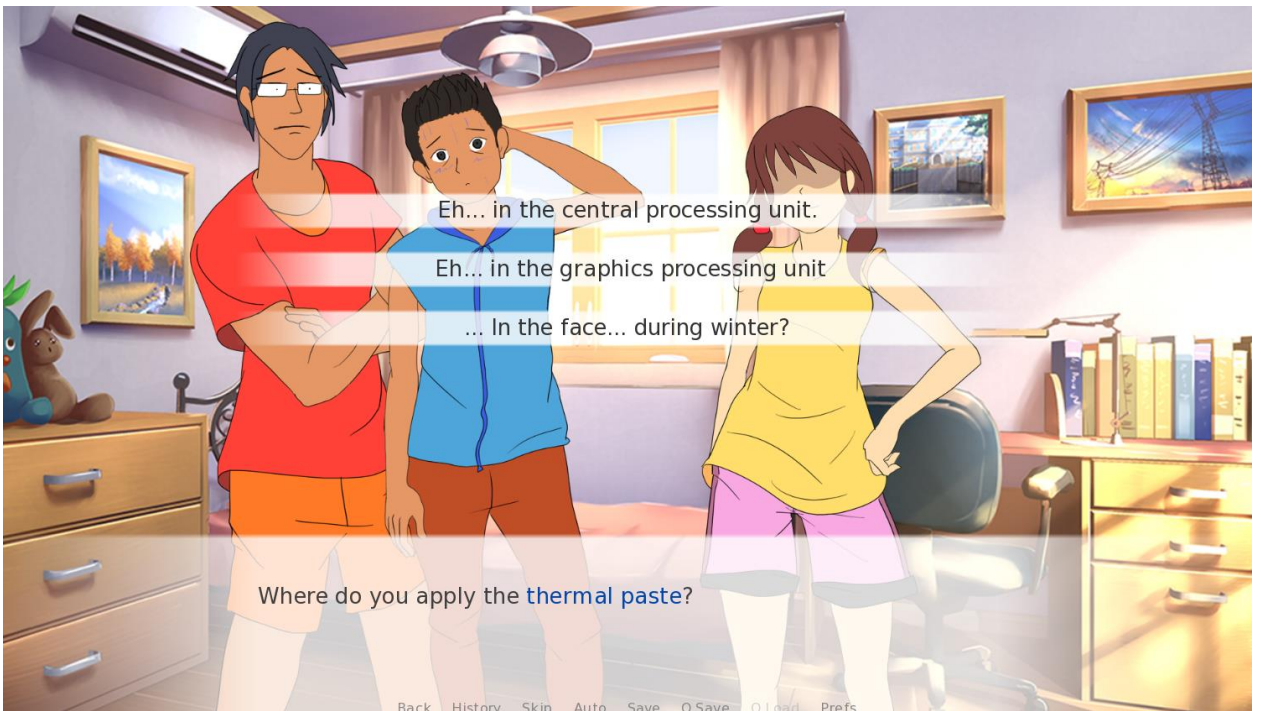
ANNEXES

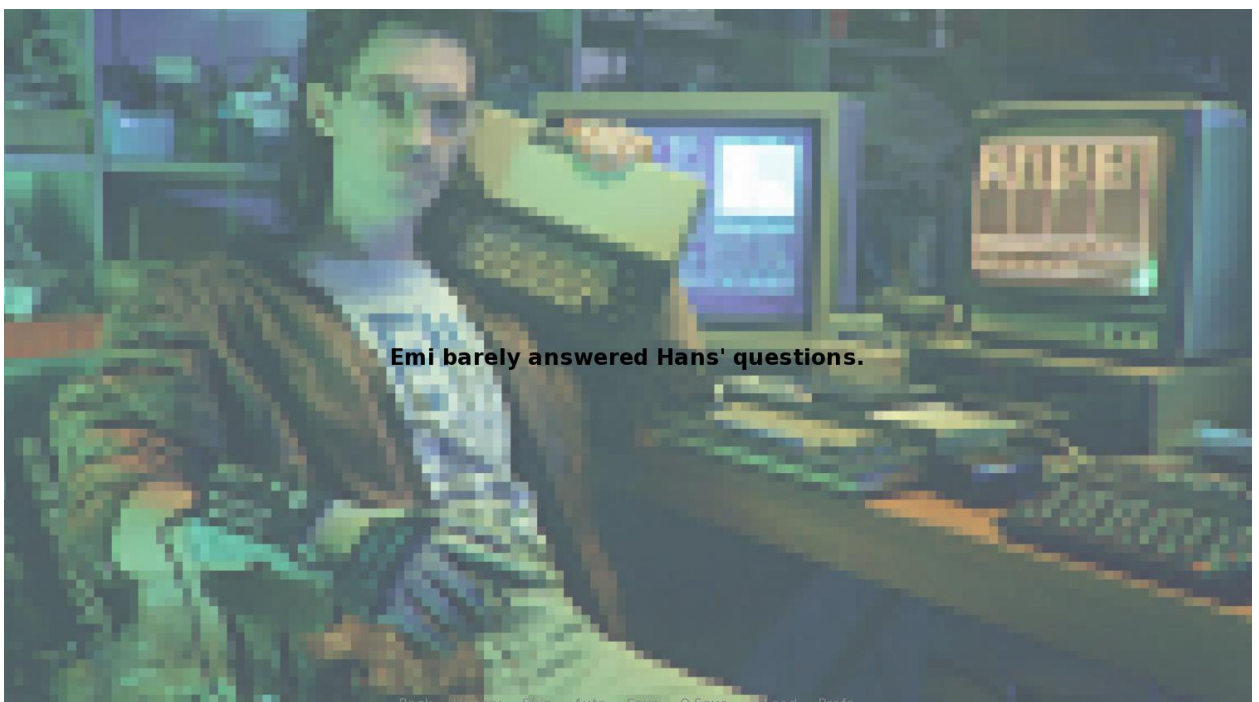
Annex A. Interactive Software

Link:

<https://drive.google.com/drive/folders/1OwsXEg-ixzU7vXSftmTy03xI2vsey7sq?usp=sharing>







Prefiere: *

- Historias ambientadas en el Ecuador
- Historias ambientadas en lugares del extranjero
- Historias ambientadas en mundos fantasía
- Historias ambientadas en mundos de ciencia ficción
- Otros: _____

¿Le gustan los libros de historias/relatos escritos en inglés? ¿Por qué? *

Máximo 300 caracteres

Tu respuesta

¿Considera que leer libros en inglés es una valiosa estrategia para aprender y practicar inglés? ¿Por qué? *

Máximo 300 caracteres

Tu respuesta

¿Qué características considera son las más importantes que un libro de relatos/historias para aprender vocabulario inglés dirigido a Ecuatorianos debería contener? *

Selecciona 3 respuestas

- Temas interesantes
- Referencias a la cultura Ecuatoriana
- Referencias a culturas extranjeras
- Ilustraciones
- Un glosario
- Preguntas de comprensión lectora
- Traducciones al idioma español

Opcional | ¿Qué otra característica considera importante?

Tu respuesta

Conocimiento General de Informática

¿Qué tanto conocimiento tiene de Informática? *

	1	2	3	4	5	
Poco	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Mucho

¿Qué tan bien conoce las partes internas de una computadora? *

	1	2	3	4	5	
Poco	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Mucho

¿Qué tan bien conoce cómo funciona el software en una computadora? *

	1	2	3	4	5	
Poco	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Mucho

¿Qué tan bien conoce cómo funciona el Internet? *

	1	2	3	4	5	
Poco	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Mucho

¿Utiliza o ha utilizado alguna aplicación o sistema operativo en idioma Inglés? *

No

Sí

En caso de haber respondido Sí a la anterior pregunta, ¿Qué aplicación o sistema operativo usa o ha usado en idioma inglés?

Tu respuesta

¿Utiliza dispositivos electrónicos exclusivamente para su trabajo o estudios? *

Sí

No

¿Cuál de los siguientes dispositivos electrónicos utiliza más en su vida diaria? *

Computadora (Windows)

Smartphone (Android)

iPhone

Mac

Ninguno

Otros: _____

Seleccione los dispositivos electrónicos que tenga total disponibilidad en su hogar. *

En caso de tener varios de un mismo tipo, seleccione solo una casilla.

Computadora (Windows)

Smartphone (Android)

iPhone

Mac

Ninguno

Otros: _____

Annex C. Post-test

Informatics Vocabulary Quizz

Name: _____

Date: _____

1. Look at the pictures and choose the correct answer.



<input type="checkbox"/>	Mouse
<input type="checkbox"/>	Central processing unit
<input type="checkbox"/>	Graphics processing unit
<input type="checkbox"/>	Keyboard



<input type="checkbox"/>	Mouse
<input type="checkbox"/>	Graphics processing unit
<input type="checkbox"/>	Keyboard
<input type="checkbox"/>	Central processing unit



	Graphics processing unit
	Central processing unit
	Keyboard
	Mouse



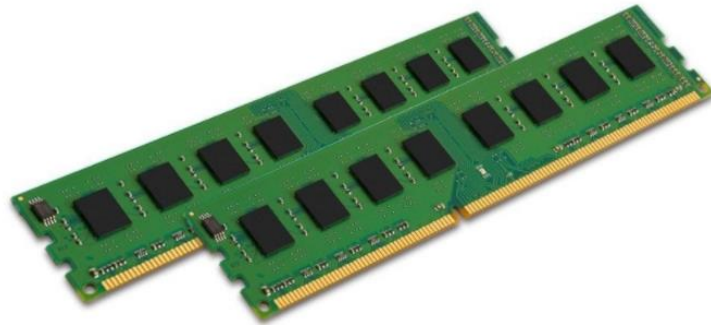
	Central processing unit
	Graphics processing unit
	Keyboard
	Mouse



	Power source
	Random access memory
	Hard drive
	Thermal paste



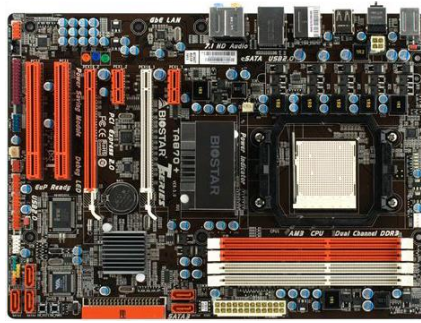
	Thermal paste
	Hard drive
	Power source
	Random access memory



	Power source
	Hard drive
	Random access memory
	Thermal paste



	Hard drive
	Random access memory
	Thermal paste
	Power source



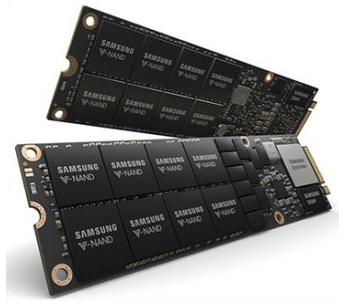
	Motherboard
	Monitor
	Speakers
	State Solid Disk



	Speakers
	Motherboard
	State Solid Disk
	Monitor



	Speakers
	State Solid Disk
	Motherboard
	Monitor



	Monitor
	Speakers
	Motherboard
	State Solid Disk

2. Choose the correct answer.

a) What is **Hardware**?

	Written instructions following certain rules that the computer executes.
	The physical parts of a computer.
	A program designed for the user.
	The applications and programs a computer uses.

b) What is **Software**?

	Written instructions following certain rules that the computer executes.
	The applications and programs a computer uses.
	A program designed for the user.
	The physical parts of a computer.

c) What is an **Application**?

	The applications and programs a computer uses.
	The physical parts of a computer.
	Written instructions following certain rules that the computer executes.
	A program designed for the user.

d) In informatics, what is a **Code**?

	The physical parts of a computer.
	Written instructions following certain rules that the computer executes.
	The applications and programs a computer uses.
	A program designed for the user.

e) What does the **Basic Input Output System (BIOS)** do?

	It facilitates the interaction between software and hardware.
	It records sounds.
	It manages the hardware, software resources, and provides common services.
	It helps the computer perform basic functions (booting, hardware control and many more).

f) What does an **Operative System** do?

	It helps the computer perform basic functions (booting, hardware control and many more).
	It records sounds.
	It facilitates the interaction between software and hardware.
	It manages the hardware, software resources, and provides common services.

g) What does the **Kernel** do?

	It records sounds.
	It facilitates the interaction between software and hardware.
	It helps the computer perform basic functions (booting, hardware control and many more).
	It manages the hardware, software resources, and provides common services.

h) What does a **Microphone** do?

	It facilitates the interaction between software and hardware.
	It records sounds.
	It helps the computer perform basic functions (booting, hardware control and many more).
	It manages the hardware, software resources, and provides common services.

i) In informatics, what is **data**?

	Any kind of information such as numbers, text, images, music, videos, etc.
	The single unit of information in informatics.
	Images, videos, audio, videogames, etc.
	The smallest element of a digital picture.

j) What is a **bit**?

	The single unit of information in informatics.
	Any kind of information such as numbers, text, images, music, videos, etc.
	Images, videos, audio, videogames, etc.
	The smallest element of a digital picture.

k) What is **digital media**?

	The single unit of information in informatics.
	Images, videos, audio, videogames, etc.
	Any kind of information such as numbers, text, images, music, videos, etc.
	The smallest element of a digital picture.

l) What is a **pixel**?

	Any kind of information such as numbers, text, images, music, videos, etc.
	The smallest element of a digital picture.
	Images, videos, audio, videogames, etc.
	The single unit of information in informatics.

3. Complete the following sentences

a) A byte is _____ bits.

	Eight
	Approximately one million
	One
	One thousand twenty four

b) A megabyte is _____ kilobytes.

	Approximately one million
	One
	One thousand twenty four
	Eight

c) 1024 megabytes are _____ gigabyte.

	Eight
	Approximately one million
	One thousand twenty four
	One

d) A Terabyte is _____ megabytes.

	One
	Approximately one million
	One thousand twenty four
	Eight

e) Resolution refers to the number and ratio of _____ a screen have.

	Pixels
	Damage
	Graphics or text
	Messages

f) A printer makes persistent representations of _____, usually on paper.

	Graphics or text
	Messages
	Damage
	Pixels

g) An electronic mail is a method of exchanging _____ between people.

	Pixels
	Damage
	Messages
	Graphics or text

h) Malware is any software designed to cause _____ to a computer.

	Graphics or text
	Damage
	Pixels
	Messages

i) An antivirus _____ malware.

	Hangs out and shares
	Displays
	Prevents, detects, and removes
	Accesses

j) Social networks are virtual spaces where a person _____ personal information.

	Accesses
	Displays
	Prevents, detects, and removes
	Hangs out and shares

k) A web browser is software that _____ the internet.

	Accesses
	Prevents, detects, and removes
	Displays
	Hangs out and shares

l) A web page _____ images, videos, text, etc when we are navigating the internet.

	Accesses
	Displays
	Hangs out and shares
	Prevents, detects, and removes

m) Uploading means we _____ data from our device to the internet

	Send
	Reference
	Receive
	Speed

n) Downloading means we _____ data from the internet.

	Speed
	Reference
	Send
	Receive

o) Bandwidth refers to _____ of the internet connection.

	Reference
	Receive
	Speed
	Send

p) A hyperlink is a _____ to a specific Web Page or data.

	Reference
	Send
	Speed
	Receive

Annex D. User Experience Survey

Encuesta experiencia del usuario

- ¿Cuál es su nacionalidad?

- Seleccione su rango de edad:

<input type="checkbox"/>	18 a 30 años
<input type="checkbox"/>	30 a 40 años
<input type="checkbox"/>	40 a 50 años
<input type="checkbox"/>	50+ años

- Sexo

<input type="checkbox"/>	Mujer
<input type="checkbox"/>	Hombre
<input type="checkbox"/>	Prefiero no decirlo

¿Qué tan entretenida le pareció las historias interactivas?

Poco entretenida	1	2	3	4	5	Muy entretenida
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

¿Qué tan intuitivo fue el manejo de las aplicaciones?

Poco intuitivo	1	2	3	4	5	Muy intuitivo
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

¿Qué tan rejugables cree que son las aplicaciones?

Poco rejugables	1	2	3	4	5	Muy rejugables
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

¿Cree que hay incentivos suficientes para usar las aplicaciones de nuevo?

<input type="checkbox"/>	Sí
<input type="checkbox"/>	No

¿Cree que este tipo de historias interactivas son útiles para aprender vocabulario técnico?

<input type="checkbox"/>	Sí
<input type="checkbox"/>	No
<input type="checkbox"/>	No estoy segur@

Después de usar el software. ¿Qué tanto vocabulario de informática en inglés cree que aprendió?

Nada	0	1	2	3	4	5	Mucho

Después de usar el software. ¿Qué tanto inglés general cree que aprendió? *

Nada	0	1	2	3	4	5	Mucho

Después de usar el software. ¿Qué tanto cree que su nivel de lectura en inglés mejoró?

No mejoró nada	0	1	2	3	4	5	Mejóro mucho

¿Qué tanto tiempo usó las aplicaciones?

¿Cuántas veces usó las aplicaciones?

¿Cuál fue su parte favorita de las aplicaciones?

¿Cuál fue su parte favorita de las historias?

¿Cuál fue su historia favorita y por qué?

¿Cuál fue su parte menos favorita del software?

¿Cuál fue su parte menos favorita de la historia?

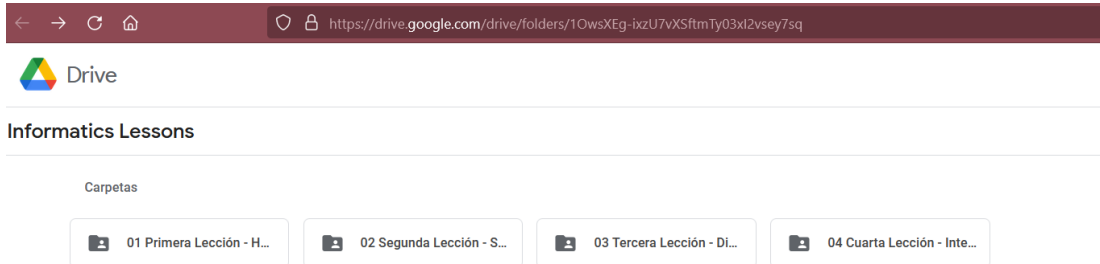
¿Qué tal le pareció las referencias a la cultura Ecuatoriana?

¿Tiene alguna opinión o sugerencia?

Annex E. Installation Guide

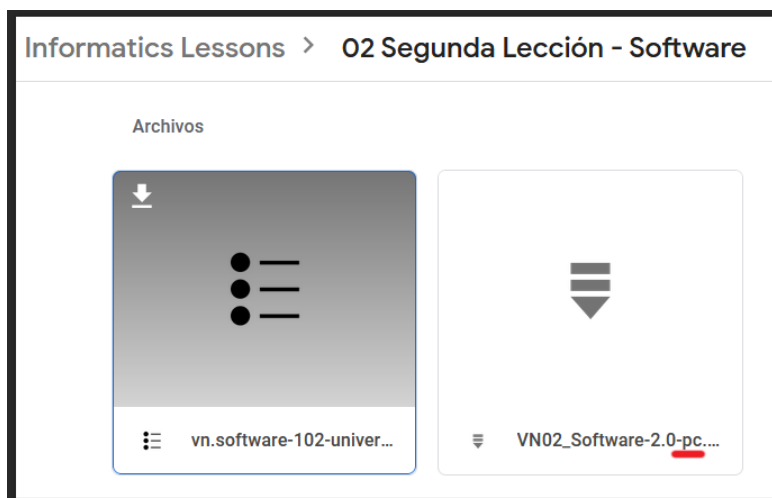
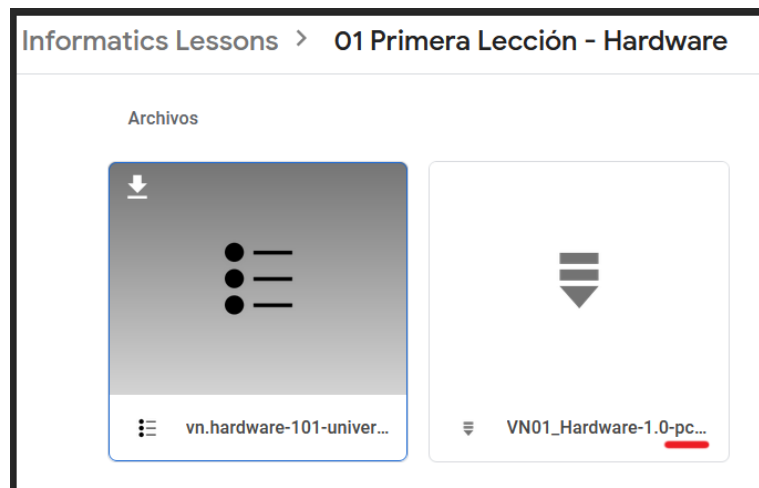
INSTRUCCIONES DE INSTALACIÓN

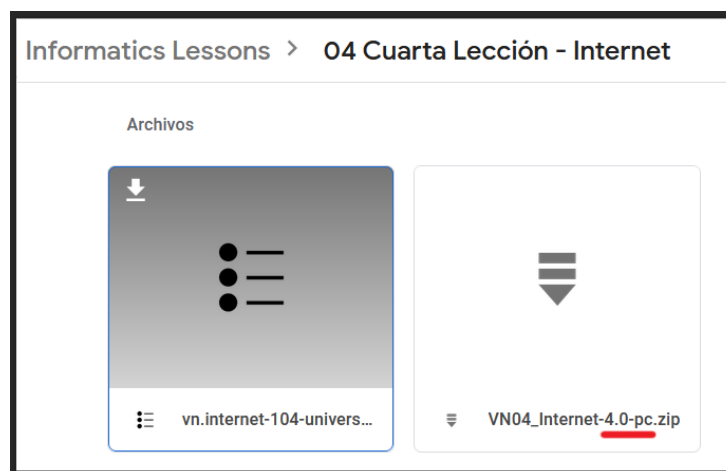
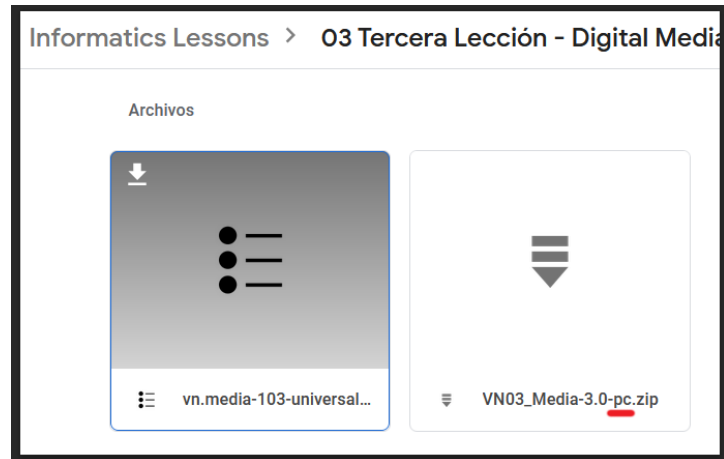
1. Ir al link <https://drive.google.com/drive/folders/1OwsXEg-ixzU7vXSftmTy03xl2vsey7sq?usp=sharing> en un navegador (Chrome, Firefox, etc)



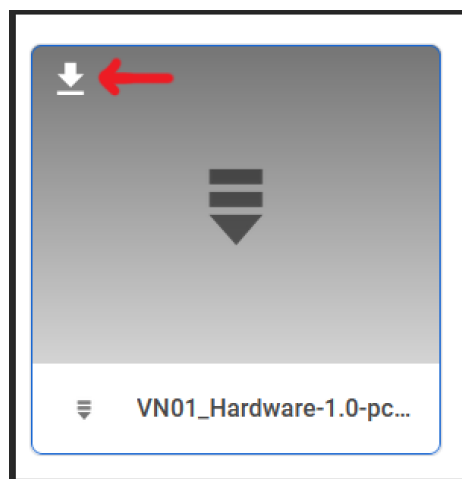
CADA CARPETA TIENE DOS ARCHIVOS:

El de la izquierda es el instalador para teléfonos inteligentes android y el de la derecha un archivo comprimido PARA COMPUTADOR (PC).

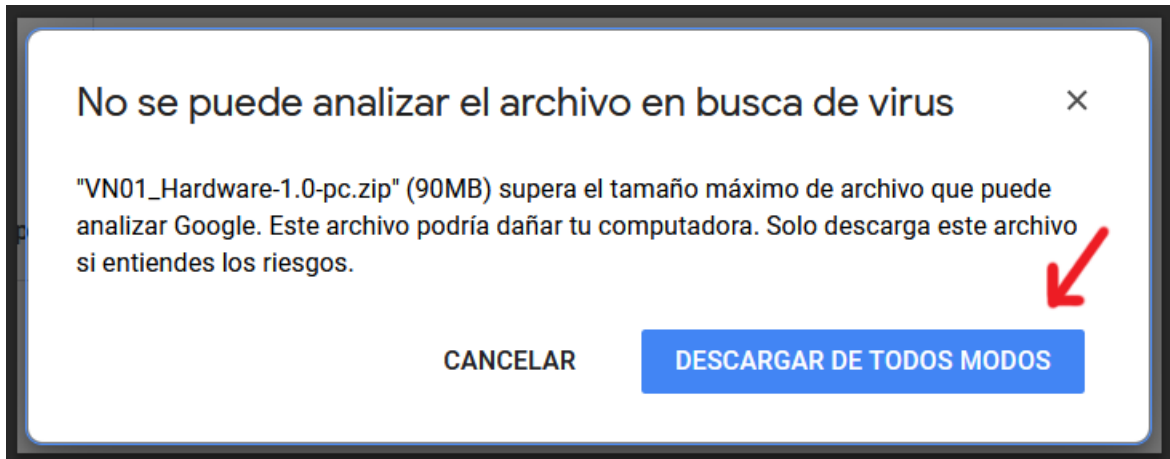




2. Descargar los archivos para PC.



Al tratar de descargar puede salir la siguiente advertencia, dar click en “Descargar de todos modos”



En algunos casos el navegador puede pedir donde descargar un archivo. Descárguelo en una carpeta de su preferencia.

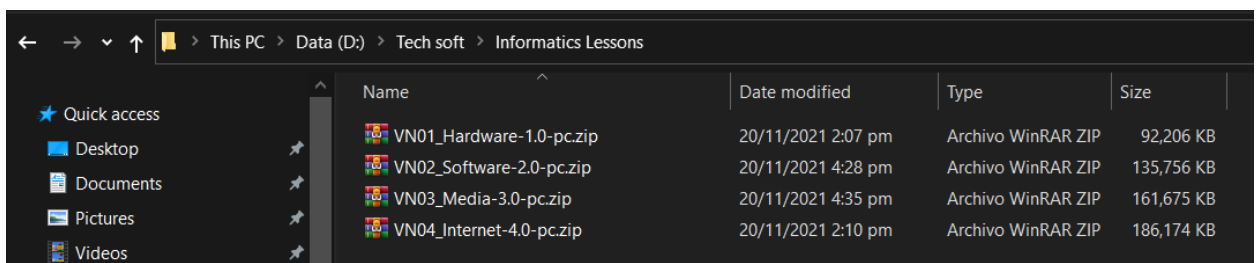
3. Descomprimir los archivos.

OPCIÓN A

Puede usar cualquier programa adicional como winrar (Puede descargar este programa gratis)

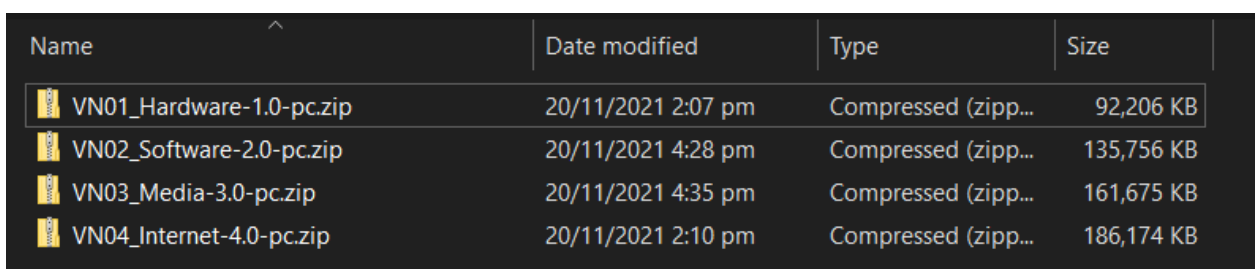
El siguiente link lleva a un video explicativo.

<https://www.youtube.com/watch?v=AZcH24tUM8Y>

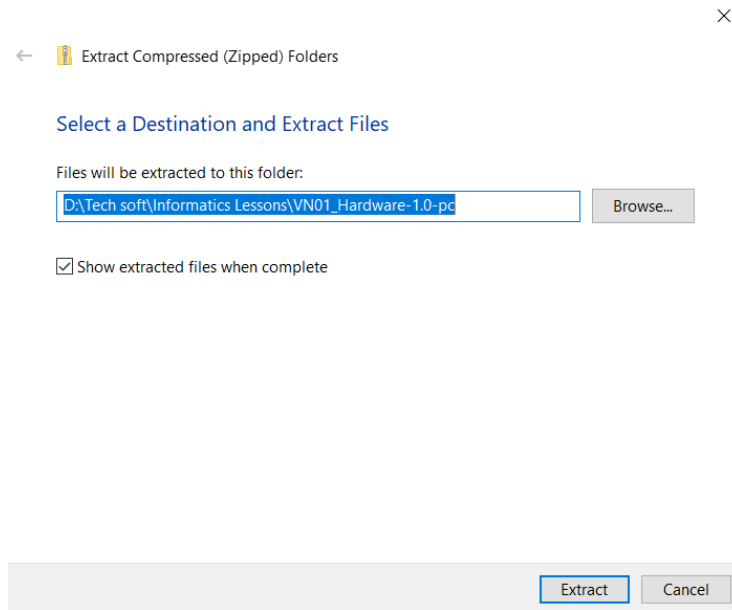


OPCIÓN B

Windows 10 puede descomprimir los archivos sin necesidad de un programa adicional.
Dar click derecho en cada archivo y seleccionar extraer todo.

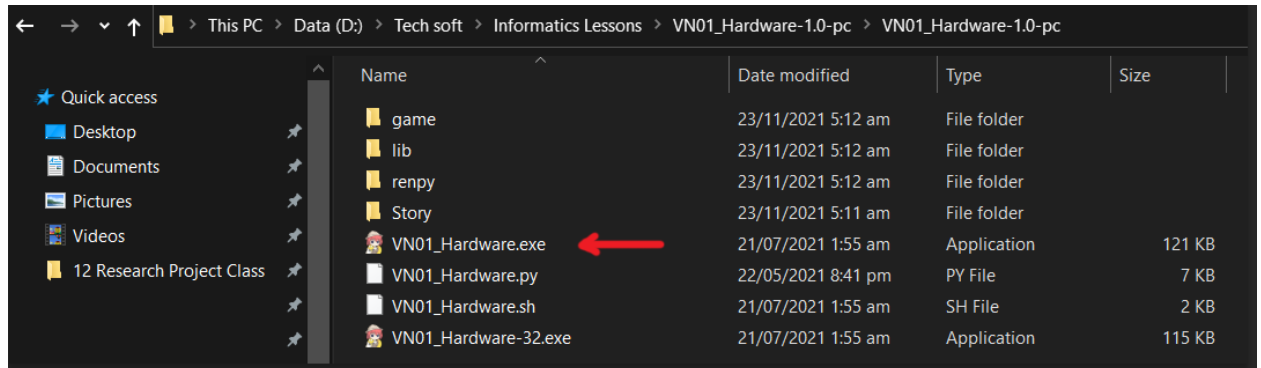


Seleccionar donde extraer los archivos

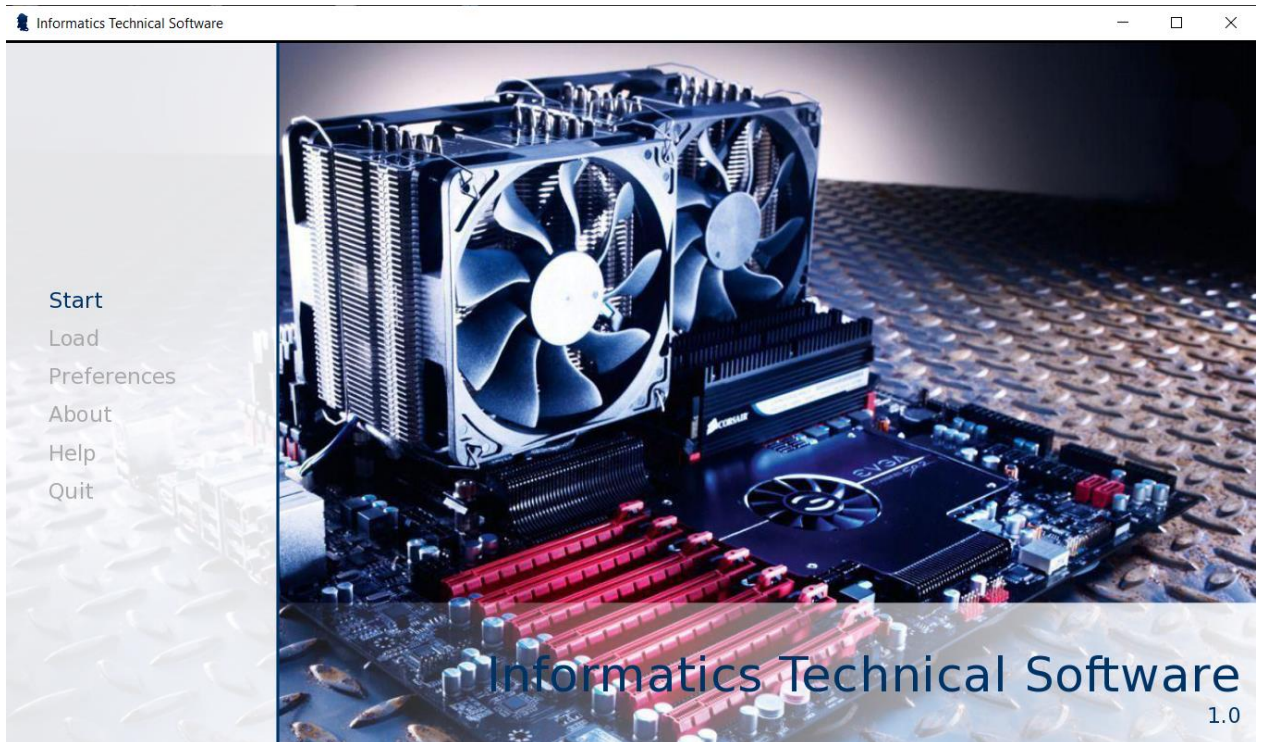


4. Ejecutar el programa.

La carpeta descomprimida se ve de esta manera. Dar doble click en el archivo **VN01_Hardware.exe** (VN02_Software.exe, VN03_Media.exe y VN04_Internet.exe para las demás carpetas descomprimidas) y el programa se ejecutará.



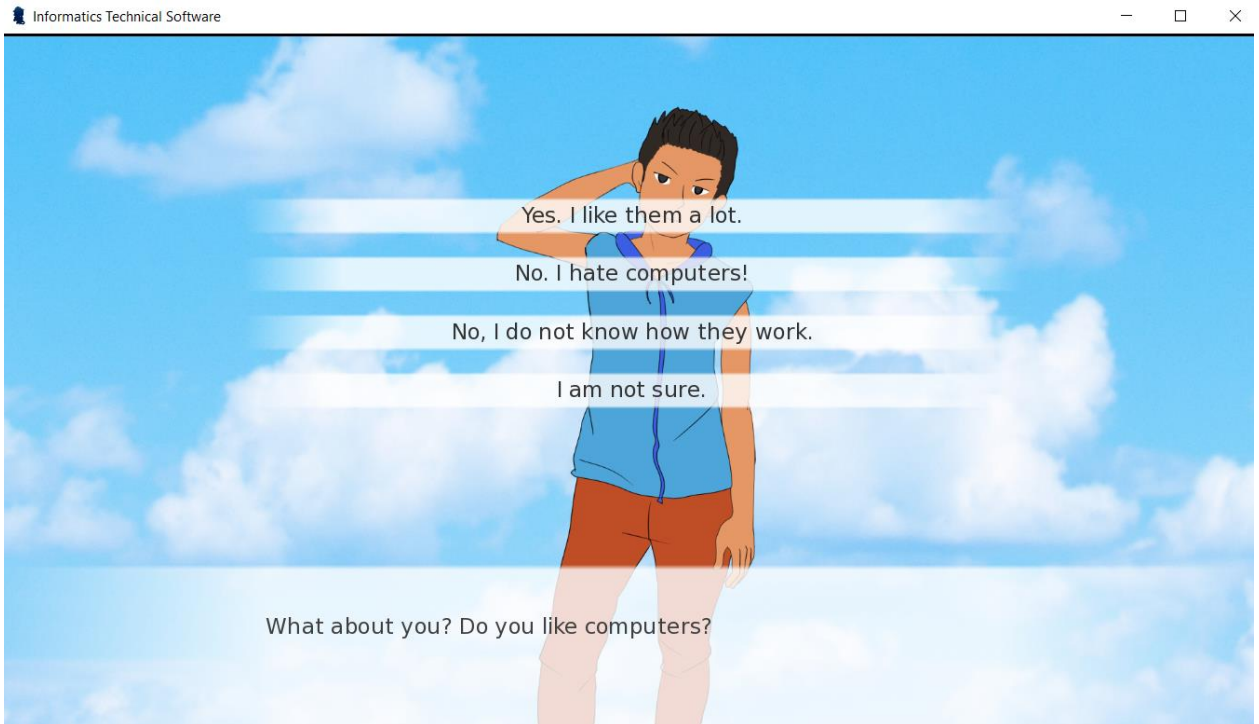
La pantalla de inicio luce de esta forma. Dar click en start y la historia empezará



La aplicación consiste en historias interactivas. Dar click en cualquier parte de la pantalla continua con la historia.



A veces algunas preguntas aparecerán para medir su comprensión de la historia, dependiendo de la opción que elijas la historia puede cambiar.



La gramática así como el vocabulario son simples, pero si siente la necesidad puede usar un diccionario.

NOTA. En dispositivos Android solo basta con descargar el instalador e instalarlo como si fuese cualquier aplicación.

Annex F. Lesson Plans

Lesson Plan 1

Time: 120 minutes

Course: A1 and Pre-A1 English adult students

Topic: Hardware

Strategy: Playing a visual novel, interacting with it and choosing the right questions accordingly the reading.

Objective: To develop reading skills as well as acquiring technical vocabulary regarding hardware components found inside a personal computer.

Resources: Set of cards, visual novel videogame

Warming Up (5-10 minutes)

The teacher will hand out 2 set of cards, the first one will have images of the hardware components and the second one their writing names, students work in pairs in order to pair the sets of cards.

Activity (3 sets of 30 minutes and 2 breaks of 5 minutes)

-Students work alone, but are allowed to ask their teacher or classmates for help.

-Students play the videogame and answer the questions; they are allowed to use a dictionary of any kind.

-During each break, students are divided in pairs and are encouraged to compare answers and talk about the vocabulary they have learned.

Wrap up (5 – 10 minutes)

-Students save the game in case they have not finished it and are asked to finish it by themselves as homework.

-Students who finished the game are asked to replay it and find all the secret dialogues and endings available.

Lesson Plan 2

Time: 120 minutes

Course: A1 and Pre-A1 English adult students

Topic: Software

Strategy: Playing a visual novel, interacting with it and choosing the right questions accordingly the reading.

Objective: To develop reading skills as well as acquiring technical vocabulary regarding basic software terms.

Resources: video, visual novel videogame

Warming Up (5-10 minutes)

The teacher will play a video about the principles of software; students will work in pairs and will be asked to write down the weirdest terms they have heard in their notebook. The teacher will give a brief explanation about the most popular terms written down by students.

Activity (3 sets of 30 minutes and 2 breaks of 5 minutes)

-Students work alone, but are allowed to ask their teacher or classmates for help.

-Students play the videogame and answer the questions; they are allowed to use a dictionary of any kind.

-During each break, students are divided in pairs and are encouraged to compare answers and talk about the vocabulary they have learned.

Wrap up (5 – 10 minutes)

-Students save the game in case they have not finished it and are asked to finish it by themselves as homework.

-Students who finished the game are asked to replay it and find all the secret dialogues and endings available.

Lesson Plan 3

Time: 120 minutes

Course: A1 and Pre-A1 English adult students

Topic: Digital Media

Strategy: Playing a visual novel, interacting with it and choosing the right questions accordingly the reading.

Objective: To develop reading skills as well as acquiring technical vocabulary regarding digital media terms that are used in daily life.

Resources: video, visual novel videogame

Warming Up (5-10 minutes)

The teacher will hand out 2 set of cards, the first one will have images of digital media common hardware and some terms; the second set will have their writing names, students work in pairs in order to pair the sets of cards.

Activity (3 sets of 30 minutes and 2 breaks of 5 minutes)

-Students work alone, but are allowed to ask their teacher or classmates for help.

-Students play the videogame and answer the questions; they are allowed to use a dictionary of any kind.

-During each break, students are divided in pairs and are encouraged to compare answers and talk about the vocabulary they have learned.

Wrap up (5 – 10 minutes)

-Students save the game in case they have not finished it and are asked to finish it by themselves as homework.

-Students who finished the game are asked to replay it and find all the secret dialogues and endings available.

Lesson Plan 4

Time: 120 minutes

Course: A1 and Pre-A1 English adult students

Topic: Internet

Strategy: Playing a visual novel, interacting with it and choosing the right questions accordingly the reading.

Objective: To develop reading skills as well as acquiring technical vocabulary regarding internet terms that are used in daily life.

Resources: video, visual novel videogame

Warming Up (5-10 minutes)

The teacher will play a video about the basics of internet; students will work in pairs and will be asked to write down the terms they think are the most important in their note book. The teacher will give a brief explanation about the most popular terms written down by students.

Activity (3 sets of 30 minutes and 2 breaks of 5 minutes)

-Students work alone, but are allowed to ask their teacher or classmates for help.

-Students play the videogame and answer the questions; they are allowed to use a dictionary of any kind.

-During each break, students are divided in pairs and are encouraged to compare answers and talk about the vocabulary they have learned.

Wrap up (5 – 10 minutes)

-Students save the game in case they have not finished it and are asked to finish it by themselves as homework.

-Students who finished the game are asked to replay it and find all the secret dialogues and endings available.

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