



UNIVERSIDAD DE CUENCA

Facultad de Filosofía, Letras y Ciencias de la Educación

Carrera de Lengua y Literatura Inglesa

“An aid to study phonetics: Wireframe and Storyboard of a cell phone application as an educational tool for students of the english literature major at the University of Cuenca”

Trabajo de titulación previo a la obtención del
título de Licenciados en Ciencias de la
Educación en Lengua y Literatura Inglesa

Autores:

Zulema Izamar Peña Alvarez
C.I. 0105839567

Francisco Andrés Urgilez Quizhpi
C.I. 0105467377

Director:

Mgst. Mónica Patricia Abad Célleri

C.I. 0102253952

Cuenca – Ecuador

2019



RESUMEN

Los futuros docentes de inglés de la Universidad de Cuenca han demostrado tener ciertas dificultades al momento de producir los sonidos de las vocales y consonantes en inglés, debido a que algunos no son familiares y, por ende, difieren en pronunciación con los de su lengua materna. Por lo tanto, el propósito de este estudio es diseñar un Wireframe y Storyboard de un prototipo de aplicación móvil como ayuda para practicar y mejorar la pronunciación en inglés. Para cumplir con este objetivo, los errores de pronunciación más comunes de los estudiantes de cuarto semestre quienes cursaban la materia de Fonética inglesa fueron obtenidos mediante una prueba de pronunciación diagnóstica, que demostró que los participantes tenían dificultades al pronunciar ciertos sonidos de las vocales y consonantes en inglés. Además, se realizó dos encuestas para determinar la accesibilidad de los participantes a Internet, sus métodos para practicar los sonidos del inglés y sus observaciones positivas o negativas sobre el prototipo. Los resultados revelaron que la gran mayoría de los participantes tienen teléfonos inteligentes con acceso a Internet, casi siempre usan Internet para practicar su pronunciación de los sonidos en inglés y están dispuestos a usar la aplicación móvil propuesta como una ayuda para estudiar Fonética. Los errores de pronunciación más comunes enumerados en esta tesis pueden servir como referencia futura para que los maestros de inglés como lengua extranjera planifiquen sus clases con precisión y aborden estos problemas desde el principio.

Palabras clave: Errores de pronunciación. Prototipo. Inglés como lengua extranjera.



ABSTRACT

Future English teachers at the University of Cuenca have demonstrated to have certain difficulties while producing English vowel and consonant sounds that are unfamiliar and different in pronunciation from the ones in their mother tongue. Therefore, the purpose of this study is to design a wireframe and storyboard of a mobile application prototype as an aid to practice and improve English pronunciation. In order to fulfill this goal, the most common pronunciation errors were elicited from fourth semester students coursing Phonetics through a diagnostic pronunciation test, which demonstrated that participants had difficulties while pronouncing certain English vowel and consonant sounds. In addition, two surveys were administered in order to determine the participants' internet accessibility, their methods for practicing English sounds, and their positive or negative observations on the prototype. Survey results indicate that the vast majority of participants have smartphones with internet access, almost always use the internet to practice their pronunciation on English sounds, and are willing to use the proposed mobile application as an aid to study Phonetics. The most common pronunciation errors listed in this thesis may serve as future reference for EFL teachers to plan their classes precisely and address these problems from the start.

Key words: Pronunciation errors. Prototype. English as a foreign language.



TABLE OF CONTENTS

Abstract.....	2
Resumen.....	3
Acknowledgment.....	4
Dedication.....	5
Table of contents.....	6
Cláusula de propiedad intelectual.....	11
Cláusula de Licencia y Autorización para Publicación en el Repositorio Institucional.....	13
Introduction.....	15
Chapter I: The Study	17
1.1 Background	17
1.2 Statement of the Problem.....	20
1.3 Research Questions.....	22
1.4 Significance of the Study	22
1.5 General Objective.....	23
1.5.1 Specific Objectives	23
1.6. Phonetic symbols used in the thesis.....	24
Chapter II: Theoretical Framework	26
2.1 American and British English.....	26
2.2 English Pronunciation.....	27
2.3 Phonetics and Phonology.....	28
2.4 English Pronunciation Errors by Spanish Speakers.....	29
2.4.1 Consonants.....	29
2.4.2 Vowels.....	31



2.4.3 Stress and Aspiration.....32

2.5 Methods for teaching English Pronunciation.....33

 2.5.1 Naturalistic method.....34

 2.5.2 Phonetic transcription method.....34

 2.5.3 Minimal pair drills method.....34

 2.5.4 Sentence drills or contextualized minimal pairs.....34

 2.5.5 Visual reinforcement.....35

 2.5.6 Vowel shifts and stress shifts drills.....35

 2.5.7 Tongue twisters.....35

 2.5.8 Reading out loud.....35

 2.5.9 Recordings.....36

2.6 Tips for teaching Consonants, Vowels, and Stress.....36

2.7 Technology and English Pronunciation.....39

 2.7.1 Mobile Applications and Pronunciation.....39

 2.7.2 Online Forums.....41

 2.7.3 Disadvantages while using Technology.....42

2.8 Conclusion.....42

2.9 Literature Review43

 2.9.1 Approaches while dealing with teaching English pronunciation43

 2.9.2 Eliciting common Mistakes45

 2.9.3 Pronunciation Improvement through technology.....48

 2.9.4 Mobile Pronunciation Learning.....50

 2.9.5 Conclusion.....53

Chapter III: Research Methodology.....55

3.1 Participants.....55



3.2 Data Collection Instruments.....56

3.3 Procedure.....57

 3.3.1 Data Collection and Analysis.....57

3.4 Ethical Considerations.....58

3.5 Limitations.....59

Chapter IV: Results and Discussion.....60

5.1 Results: Diagnostic Test.....60

 5.1.1 Discussion.....70

5.2 Results: Surveys.....72

 5.2.1 Discussion.....78

5.3 Creation of the Cellphone Application.....80

 5.3.1 Wireframe and Storyboard Procedure.....81

Chapter V: Conclusion85

References.....88

Appendix A: Declaración de Consentimiento.....99

Appendix B: Preliminary Diagnostic Test.....100

Appendix C: Survey - Encuesta #1.....103

Appendix D: Survey - Encuesta #2.....104

Appendix E: Mobile Application Prototype.....105

List of Tables and Figures

Table 1: IPA vs. AHD.....25

Table 2: Long vowels vs. short vowels32

Table 3: List of the Pronunciation Errors.....61

Table 4: Top 11 - Most Common Pronunciation Errors.....68



Table 5: Special cases.....69

Table 6: Main Menu’s Structure.....82

Figure 1: Stress patterns for practicing shifting the major stress.....39

Figure 2. Availability of Smartphones.....72

Figure 3. Internet access.....73

Figure 4. Accessing internet to practice English sounds.....73

Figure 5. Difficultness while looking for web pages to practice English sounds74

Figure 6. Acceptance of the use a mobile application as tool for practicing English sounds..74

Figure 7. Acceptance of “PHONIKS” as an educational tool.....75

Figure 8. Level of difficulty while using “PHONIKS”.....75

Figure 9. Topics that should not be included in the prototype.....76

Figure 10. The most useful topics in the prototype.....77

Figure 11. App icon.....105

Figure 12. Iphone’s Main Menu.....105

Figure 13. Log in tab.....105

Figure 14. Phoniks’ Main Menu.....105

Figure 15. Main Menu: Phonetics Characteristics.....106

 Figure 15.1. Sub Menu: What is Phonetics?.....106

 Figure 15.2. Sub Menu: Speech Organs.....106

 Figure 15.2.1. Speech Organs Activity.....106

 Figure 15.2.2. Speech Organs activity interaction.....107

 Figure 15.3. Sub Menu: American Heritage Dictionary.....107

 Figure 15.4. Sub Menu: Consonants.....107

 Figure 15.5. Sub Menu: Vowels.....107

 Figure 15.6 Sub Menu: Vowel Chart.....108



Figure 15.6.1. Vowels Activity.....108

Figure 15.7. Sub Menu: Suprasegmentals.....108

Figure 16. Main Menu: Common Spanish Speakers Errors.....108

Figure 16.1. Sub Menu: Video - lips/tongue/teeth movement.....109

Figure 17. Main Menu: Forum.....109

Figure 18. Main Menu: About us.....109



Cláusula de licencia y autorización para publicación en el Repositorio Institucional

Zulema Izzamar Peña Alvarez en calidad de autora y titular de los derechos morales y patrimoniales del trabajo de titulación "An Aid to Study Phonetics: Wireframe and Storyboard of a cell phone application as an educational tool for students of the English Literature major at the University of Cuenca", de conformidad con el Art. 114 del CÓDIGO ORGÁNICO DE LA ECONOMÍA SOCIAL DE LOS CONOCIMIENTOS, CREATIVIDAD E INNOVACIÓN reconozco a favor de la Universidad de Cuenca una licencia gratuita, intransferible y no exclusiva para el uso no comercial de la obra, con fines estrictamente académicos.

Asimismo, autorizo a la Universidad de Cuenca para que realice la publicación de este trabajo de titulación en el repositorio Institucional, de conformidad a lo dispuesto en el Art. 144 de la Ley Orgánica de Educación Superior.

Cuenca, 05 de febrero del 2019

Zulema Izzamar Peña Alvarez

C.I: 0105839567



Cláusula de licencia y autorización para publicación en el Repositorio Institucional

Francisco Andrés Urgilez Quizhpi en calidad de autor y titular de los derechos morales y patrimoniales del trabajo de titulación "An Aid to Study Phonetics: Wireframe and Storyboard of a cell phone application as an educational tool for students of the English Literature major at the University of Cuenca", de conformidad con el Art. 114 del CÓDIGO ORGÁNICO DE LA ECONOMÍA SOCIAL DE LOS CONOCIMIENTOS, CREATIVIDAD E INNOVACIÓN reconozco a favor de la Universidad de Cuenca una licencia gratuita, intransferible y no exclusiva para el uso no comercial de la obra, con fines estrictamente académicos.

Asimismo, autorizo a la Universidad de Cuenca para que realice la publicación de este trabajo de titulación en el repositorio institucional, de conformidad a lo dispuesto en el Art. 144 de la Ley Orgánica de Educación Superior.

Cuenca, 05 de febrero del 2019

Francisco Andrés Urgilez Quizhpi

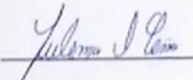
C.I: 0105467377



Cláusula de Propiedad Intelectual

Zulema Izamar Peña Alvarez, autora del trabajo de titulación "An Aid to Study Phonetics: Wireframe and Storyboard of a cell phone application as an educational tool for students of the English Literature major at the University of Cuenca", certifico que todas las ideas, opiniones y contenidos expuestos en la presente investigación son de exclusiva responsabilidad de su autora.

Cuenca, 05 de febrero del 2019



Zulema Izamar Peña Alvarez

C.I: 0105839567



Cláusula de Propiedad Intelectual

Francisco Andrés Urgilez Quizhpi autor del trabajo de titulación "An Aid to Study Phonetics: Wireframe and Storyboard of a cell phone application as an educational tool for students of the English Literature major at the University of Cuenca", certifico que todas las ideas, opiniones y contenidos expuestos en la presente investigación son de exclusiva responsabilidad de su autor.

Cuenca, 05 de febrero del 2019

Francisco Andrés Urgilez Quizhpi

C.I.: 0105467377



ACKNOWLEDGEMENTS

We would like to thank the English major teachers at the University of Cuenca for nurturing our interest, commitment, and knowledge of English teaching throughout these four years. We would also like to thank both Phonetic teachers from the English major, Mgst. Monica Abad and Mgst. Sandra Cabrera, for letting us carry out our investigation during their classes in the March - July 2018 semester. Without their support, the development of this investigation would have not been possible. A big thank you to all the 4th semester students who were taking Phonetics, for their commitment and participation during the development of this thesis.



DEDICATION

I would like to dedicate this thesis to God for giving me the wisdom and perseverance necessary to accomplish this study and thank my mother who has always believed in me and cheered me on along the way despite the distance.

Zulema.

DEDICATION

I dedicate this thesis to my parents, Ramiro and Cecilia, and my grandparents, Enrique and Teresa who have supported me unconditionally along the way.

Francisco.



INTRODUCTION

In order to learn how to adequately pronounce foreign sounds, sentences, or phrases, learners need to first learn how to hear themselves and others. In other words, students need to be able to understand and be understood by others while using the foreign language in order to acquire good pronunciation (Shtern, 2017). Achieving intelligible pronunciation in the English language can be difficult for native Spanish learners, since the new language is generally interpreted in terms of those of the speaker's mother tongue (Finch and Lira, 1988); therefore, it becomes the responsibility of EFL teachers to deal with this complexity of new sounds, words, sentences, and phrases by exploring new ways of indicating, practicing, and giving feedback on English pronunciation (Gilakjani, 2016).

Non-native EFL or ESL teachers are used to inaccurate pronunciation since they know what students are going through, get used to their style, and most of the times even relate to the same difficulties their students face while learning a foreign language, because they once learned it too (Yoshida, 2016). Thus, it is important that EFL teachers, especially non-native, have intelligible pronunciation because they are the ones that will serve as reliable models for their students and need to be understood easily while teaching. For this reason, we have decided to research the major difficulties future EFL teachers face while pronouncing foreign words and deal with them through a mobile application in order to offer students a new way to practice and improve their pronunciation skills.

Consequently, this thesis is divided into four chapters which are distributed as follows: to begin with, chapter one exposes the background and context of the study including the importance of pronunciation training for EFL teachers and L2 learners, the methods that have been developed in order to address pronunciation problems in EFL classrooms, and how this proposal may suit well for future English teachers. Additionally, the chapter reveals the main objectives and aim of this study, which in general terms are to



analyze and compile common English pronunciation errors in order to design a wireframe and storyboard of a cellphone application.

Afterwards, in chapter two, the theoretical framework explains what American English is, why pronunciation training is important inside EFL classrooms, how Phonetics and Phonology fit in, and the most common mistakes in pronunciation among native Spanish speakers. Additionally, in chapter two, the literature review section describes previous studies that have been conducted, which reveal different methods and approaches for pronunciation training and the most common mistakes among EFL students.

Following in chapter three, the research and methodology section describes in detail how we compiled the most common errors among 4th semester students in the English major at the University of Cuenca through a diagnostic test and the considerations taken to organize and tabulate these data. Next, in chapter four, the results section explicitly exposes the data compiled, the analysis of pronunciation errors among participants from the most common to the least common, and how the examination facilitated the development of a mobile application prototype meant to help pre-service teachers practice the most difficult English sounds. Aside from this, the chapter reveals the various responses and reactions the students had when using the mobile application as an aid to practice English sounds. Also, in chapter four, the discussion section explains the importance of each finding for future English teachers and how they relate to and differ from studies and theories that have been previously established.

Lastly, the conclusion section states the final deductions based on the findings of the study. For instance, the most common errors in pronunciation among future English teachers at the University of Cuenca and previous published theories about these problems are combined in order to cultivate a personal reasoning as to why these errors may occur, and therefore fit in our proposal in a productive way.



CHAPTER I: The study

1.1 Background

While learning a foreign language, pronunciation skills come to be very necessary. As Conti (2009) mentioned, understanding grammar, acquiring a variety of vocabulary, reading and writing well, are all part of learning a language; however, not being able to pronounce words interrupts communication, especially since it is believed that learners who are unable to pronounce words are also unable to understand them. In addition, improper pronunciation can lead to a negative impression, misunderstanding, and ineffective communication (Speak, 2015).

Hudson (2013) declared that from the hundreds of thousands of English classes that take place all over the world, only a small fraction of them will have contained any pronunciation training. The reason for this is not that students do not want to learn pronunciation, but because general English teachers are not trained in teaching pronunciation. According to the author, most certificates that consent educators to teach English to foreign speakers, such as CELTA or TEFL do not offer pronunciation training, which is unfortunate since good pronunciation is what makes teachers good users of the language.

According to Yoshida (2016), EFL teachers must always strive to reach the best pronunciation possible because they are the ones that serve as reliable models for their students and need to be understood easily while teaching. The author mentioned that just as students are expected to practice the language constantly, so are non-native teachers. EFL teachers should work hard in order to gain good pronunciation by first listening to the language, imitating it in front of a mirror, reading aloud, and letting go of old pronunciation habits.

In order to develop good pronunciation skills, EFL learners should first learn to



listen and understand the language being spoken (Thering, 2017). In fact, as mentioned by Djouadselma (2015), in order to improve speaking skills, EFL learners need to have constant access to the reproduction of the target language, so that they can learn how to listen and understand it. One of the main objectives of pronunciation training is to learn how to hear oneself and others, since poor pronunciation creates an additional barrier in understanding (Shtern, 2017). According to Djouadselma (2015), while learning how to pronounce foreign sounds, foreign learners often find themselves puzzled between how the sound is produced and the urge to producing it exactly as a native speaker. Inside an EFL classroom, foreign sounds and their combinations seem to be understood and internalized correctly by students, since sometimes teachers may overlook individual mistakes; however, the usage of these sounds outside the classroom may lead students to want to have authentic listening material to count on. When students have authentic material to listen to at any time, such as video(s), songs, films, CDs, or audio books, it helps them improve their understanding and production of the English language.

While dealing with English pronunciation, computer-assisted methods or smartphone apps are also considered as a helpful resource. For example, Tanner and Landon (2009) conducted a research where they evidenced the effects of computer-assisted pronunciation readings on ESL learners. These readings exclusively considered the use of pausing, stress, intonation, and overall comprehensibility, which provides empirical evidence that supports the idea of using oral reading techniques for pronunciation improvement. Some participants significantly improved their awareness of pausing and word stress and sentence-final intonation. Additionally, the research carried out by Saran, Seferoglu, and Cagiltay (2009) considered the effects of using multimedia messages via mobile phones while dealing with English pronunciation. The results revealed that students who sent multimedia messages via mobile phones encouraged their regular study behavior by allowing users to repeat the



mobile content (new vocabulary) as many times as they wanted, whenever they wanted.

The effectiveness of new software for smartphones while helping ESL college students learn English vocabulary was demonstrated through a study conducted with a group of students from China (Wu, 2014). A Java application that contained 852 English words with their graphic diagrams, spelling, pronunciation, meaning in the Chinese language, a synonym, an antonym, part of speech and an example of the word used in a sentence was created for this study. The results showed that students using the app increased their vocabulary and improved their pronunciation a lot more than those who did not.

The EFL teaching major at the University of Cuenca offers courses that deal with teaching English to foreign learners such as TEFL, Testing and Evaluation, or ICT in an EFL classroom. Other subjects that are included in the curriculum used for future English teachers are related to improving students' production of the English language such as, Morphology, Syntax, Etymology, Reading comprehension or Academic writing. Additionally, students take Phonetics and Phonology in the English major in 4th and 5th semester respectively, in order to enhance their speaking skills.

The Phonetics course in the English major at the University of Cuenca concentrates on teaching students the correct pronunciation of the primary English sounds such as vowels and consonants. It is handled mainly by producing the sounds that are exposed in the textbook "American English Phonetics" (Youman, 2014a). In addition, some tutorial videos that serve as reference material are used during the classes to enhance the learning process. In general, this course is aimed to incite students to speak English accurately and fluently, emphasizing sounds and their combinations by listening, transcribing, and reproducing them.

The Phonetics course encourages students to concentrate on achieving a complete understanding of the distinctive manner of the English oral pronunciation. Reaching such



levels of understanding will determine whether or not the pronunciation will be appropriate (Shtern, 2017). Yoshida (2016) stated that when a foreign speaker begins to use the target language correctly in terms of pronunciation, he or she has an intelligible-pronunciation which means speaking in a way that most listeners, both native and nonnative speakers, can understand without too much effort or confusion.

The mobile application proposed in this thesis, which is meant to be used by students while coursing Phonetics, differs from those that already exist, since students will have the opportunity to deal with their own difficulties because the data used to create this app was drawn out from students just like them. Furthermore, considering other investigations, it seems reasonable to propose a tool containing diagrams, recordings, videos, and transcriptions to enhance students' pronunciation skills.

1.2 Statement of the Problem

According to Gilakjani (2016), learners with good English pronunciation are likely to be understood even if they make errors in other areas, whereas learners with bad pronunciation will not be understood, even if their grammar is perfect. The consequences for these L2 learners can be critical. For example, some may avoid speaking in English permanently, may experience social isolation, have employment difficulties or limited opportunities for further study. This author also mentioned that we judge people by the way they speak; consequently, learners with poor pronunciation may be judged as incompetent, uneducated, or lacking in knowledge. Therefore, as Yates and Zielinski (2009) stated, if teachers don't present the general rules and principles toward comprehensible pronunciation to their EFL learners, nobody will certainly do it. It is the responsibility of EFL teachers to do this by exploring new ways of indicating and teaching new English sounds, practicing, and constantly giving feedback on English pronunciation (as cited in Gilakjani, 2016).



English Phonetics at the University of Cuenca mainly concentrates on teaching specific mouth positions during the production of sounds, such as nasal sounds, oral sounds, including vowels and consonants, word stress, and intonation (Youman, 2014a). Over the years, English Phonetics teachers of the University of Cuenca have relied on extra listening and speaking material available online. For example, Rachel's English (2014), a channel dedicated to help non-native speakers improve their spoken English and listening comprehension. This has been useful since, according to Fitting Image (2013), "learning via AV (audio visual) creates a stimulating and interactive environment which is more conducive to learning" (para. 1).

Phonetics students at the University of Cuenca have access to the correct pronunciation of sounds, words, and utterances during class, due to the constant contact with the teacher and the audible material. However, students may quickly forget what they have heard leading to insufficient time available for processing and remembering, since according to Xu (2009), due to the limited capacity of the working memory, also known as the short term memory (STM), information is stored for short periods of time while it is being analyzed and interpreted.

During the English Phonetics course at the University of Cuenca, many students strive to reach proficiency and accuracy in pronouncing English speech sounds; however, their knowledge on their mother tongue usually interferes. While learning the pronunciation of a foreign language, according to Dobie and Hemel (2005), second language learners have the need to identify, discriminate and classify the different sounds they hear in the target language. As a result, while learning to improve speaking skills, students' attention is absorbed by the urge of producing sounds in an accurate way. Due to the fact that the speech sounds are new and foreign, the language learner may find himself merged into mistakes, confusion, and uncertainty, since the sounds of a new language are generally



interpreted in terms of those of the speaker's mother tongue. For instance, Finch and Lira (1988) observed that native Spanish speakers tend to equate English sounds, such as vowels and consonants, with their Spanish near-equivalents.

In order to deal with these difficulties that cause mispronunciation of the English sounds, our thesis focuses on proposing a new mobile application created to assist students while coursing Phonetics. After analyzing students' pronunciation and compiling the most common errors among students who are taking Phonetics, we created a cellphone application, "PHONIKS" that concentrates on helping students understand the pronunciation of each sound through videos, audios and figures and offering a space for practice.

Therefore, this study aims to address the following research questions:

1.3 Research Questions

- What are the most common mistakes in pronunciation among students in the English major at the University of Cuenca?
- Based on the errors found in pronunciation among students in the English major at the University of Cuenca, what are the most useful features to be included in the cell phone application?
- What are the participants' observations about the cellphone application prototype?

1.4 Significance of the Study

This thesis highlighted the most common errors in pronunciation among future EFL teachers at the University of Cuenca which served to propose a mobile application intended to deal with such difficulties. The proposed tool is a wireframe and storyboard of a cell phone application, "PHONIKS", which offers a space to explore and practice specific sounds that cause trouble because of their odd pronunciation. Hopefully, this instrument will complement other methods and tools used by EFL teachers to enhance their students' pronunciation skills.



This cell phone application prototype intends to aid students while coursing Phonetics by allowing them to hear sounds, visualize the anatomic production of each one of them, and perform rehearsal exercises whenever they want. The application prototype also gives the possibility to share questions, suggestions, and obtain feedback in the forum section, since Shute (2007) emphasized that “formative feedback represents information communicated to the learner that is intended to modify the learner’s thinking or behavior for improving learning” (p. 1).

The data exposed in this investigation can serve as future reference for EFL teachers interested in teaching pronunciation to Spanish speakers because they can use it to know which sounds need more focus on while teaching and learning English. This investigation may help EFL teachers understand why these sounds turn out to be the most difficult ones for native Spanish learners and what methods or tips can be used to deal with these difficulties.

1.5 General Objective

- To design the wireframe and storyboard of a cellphone application as an educational tool for future EFL teachers at the University of Cuenca.

1.5.1 Specific Objectives

- To analyze English pronunciation among students of the English major at the University of Cuenca in order to compile common English pronunciation errors.
- To find out about students’ perceptions on the importance and use of a cell phone application as an educational tool while learning to produce English sounds.
- To create a wireframe and storyboard of a cell phone application as a prototype for Android and iOS operating systems based on the most common mispronounced sounds among the students of the English major at the University of Cuenca.



1.6. Phonetic symbols used in the thesis

A phonetic symbol is used to represent a particular English sound and may appear in different forms according to what system is used. The American Heritage Dictionary of the English Language, which is used in the Phonetics course, is a resource that provides information not only about the meaning of words, but also about their origin and usage. Aside from this, it exposes a phonetic notation based on the Latin alphabet to transcribe the pronunciation of spoken English (Pickett, 2012).

On the other hand, the International Phonetic Alphabet (IPA) is an academic standard phonetic notation system, created by the International Phonetic Association, which uses a set of symbols to represent each distinct sound that exists in human spoken language. This system, which includes all languages spoken around the world, is based on the Latin alphabet, but includes some non-Latin characters as well (The International Phonetic Alphabet, 2017).

In this thesis, the American Heritage Dictionary (AHD) system is used throughout the entire study; therefore, the different symbols used in the studies presented have been changed to the AHD system. However, when quotations using IPA were cited, it was not possible to change the IPA symbol. For this reason, the following table shows the IPA symbols with their correspondent AHD symbol.



Table 1

IPA Symbol with its AHD Equivalent

IPA	AHD
/æ/	/ã/
/i:/	/ē/
/ɪ/	/ĩ/
/ɒ/	/õ/
/ɔ:/	/ô/
/ʌ/	/ũ/



CHAPTER II: Theoretical Framework

Native Spanish speakers often find themselves puzzled while learning to pronounce English sounds since a variety of misperceptions come about while learning a foreign language. It has been concluded that native Spanish speakers have difficulty in perceiving and pronouncing English sounds and combinations that are unfamiliar to them (Gilakjani, Ahmadi, & Ahmadi, 2011); as a result, a set of methods and tips to address these pronunciations errors have been proposed. Additionally, the use of technology as an innovative tool to aid pronunciation teaching/learning has been outlined in order to set a place for self-learning, increase student engagement with the learning process, and promote an opportunity to monitor progress. This chapter addresses some important definitions and terms related to the pronunciation field, the major pronunciation problems that Spanish speakers face while learning English pronunciation, and some methods, tips, and innovative tools that have been devised to deal with the teaching/learning pronunciation process.

2.1 American and British English

As defined by Crystal and Robins (2018), “language is a system of conventional spoken, manual, or written symbols by means of which human beings, as members of a social group and participants in its culture, express themselves” (para 1). Adding to this, Crystal and Potter (2018) stated that the English language is a West Germanic language of the Indo-European language family which has connections with French, German, and Dutch languages. English was originally the official language of England; nevertheless, historical efforts of the British Empire imposed the language in many former colonies such as the United States, Canada, Australia, and India. American English is known as the form of English used in the United States while British English is used in the United Kingdom. They both differ in pronunciation, grammar, vocabulary (lexis), spelling, punctuation, idioms, and formatting of dates and numbers (Diffen, 2018).



The British Library (2007) declared that British English is an accent also known as “Received Pronunciation” which is divided into standard and formal forms spoken by English speakers. On the other hand, Tache (2014) referred to the American accent as one which is commonly used around the world due to its spread on TV, movies, music, and large population; therefore, it is considered the easiest accent for most people to understand. Aside from that, English remarks its importance because, as mentioned in the British Council (2013), it is spoken by approximately 1.75 billion people which is about a quarter of the world’s population; therefore, it has become the dominant international language of the 21st century. The English language represents a global communication tool since it has been established as the language of communications, science, technology, business, entertainment, and diplomacy.

2.2 English Pronunciation

Quoc (2016) explained that pronunciation means being able to say a word correctly, naturally, and to be understood; therefore, when one learns to perfect his/her pronunciation skills, it will be easier to adjust in an English speaking environment. While learning a foreign language, pronunciation may be one of the most difficult abilities to develop. Thus, Teacher Finder (2017) maintains that pronunciation is the one aspect of English that many learners recognize as one of the most challenging aspects of learning the language. The unique sound-phonetic system used in English imposes linguistic obstacles on the learning process.

Mistakes, faults, or inaccuracies exist due to the complexity and variations of the language’s vowels and consonant combinations in relation to Spanish. As Teacher Finder (2017) mentioned, the number of sounds in the English language exceeds the number of vowels, consonants, and combinations of them; thus, a letter, digraph, or any combination of letters could be pronounced surprisingly different in various words.



2.3 Phonetics and Phonology

Ogden (2009) explained that Phonetics means picking the sounds of speech and defining how all the components work together, what they do, and when they do so. It is compared to hearing a piece of music and inquiring how the score is constructed. The University of Oulu (2012) provided the following definition of Phonetics:

It is the science where all aspects of speech are considered and investigated: how speech is produced using our speech organs, what are the properties of speech sounds in the air as they travel from the speaker's mouth to the ear of the listener, and, finally, how we perceive speech and recognize its structural elements as certain linguistic symbols or signs. (para. 2)

Youman (2014a) mentioned that even when speakers produce the simplest sounds, they coordinate a large number of things such as, lips, tongue, vocal cords, and breathing. Speech organs are important when producing speech sounds due to their position, movement, and articulation since all of them come together to produce an accurate speech sound. Nonetheless, consideration should not only be addressed to how speech organs move, or should move during the production of a speech sound, but also to the manner of how such sounds are perceived. This allows the listener to distinguish and recognize a sound in order to imitate it as exact as possible. That is why Saundz (2014) has suggested that foreign English speakers ought to concentrate on repeating and practicing English sounds by listening to authentic material. This practice may lead students to avoid using their mother tongue accent when accommodating to foreign sounds.

Additionally, Lanir (2011) defined Phonology as the study of the patterns present in speech sounds by stablishing how these sounds are combined within specific tacit rules. According to McMahon (2002) “Phonologists are interested in the sound patterns of particular languages, and in what speakers and hearers need to know, and children need to



learn, to be speakers of those languages” (p. 2). When a simple utterance is heard by a native and a foreigner speaker, many variances can be apparent; therefore, teaching only the sounds (Phonetics) as isolated units is not enough to reach accurate English pronunciation. This is why it is considered that Phonetics and Phonology are subjects that complement each other while teaching pronunciation (Youman, 2014b).

2.4 English Pronunciation Errors by Spanish Speakers

Students sometimes may seem overwhelmed while producing unfamiliar sounds; according to Gilakjani, Ahmadi, and Ahmadi (2011) the main problem second language learners have with pronunciation has to do with changing their conceptual pattern appropriate to their first language which has been internalized during childhood. This means that second language learners have difficulties in reproducing and accommodating new sounds, since they already have a fixed speech pattern in their mother tongue.

The following list of pronunciation errors made by Spanish speakers presented by Avery and Ehrlich (1987) reflect ESL learners’ pronunciation patterns. The difficulties are organized by categories: initiating with consonants, then vowels, and finally, stress and aspiration.

2.4.1 Consonants. While dealing with consonants, there are certain sounds and combinations that cause difficulties among native Spanish speakers. To begin with, to a native Spanish speaker, /b/ and /v/ are sounds that show difference in spelling but not in pronunciation; even though, the letter “v” is used in Spanish spelling, the sound /v/ does not exist. In word initial position, Spanish speakers may pronounce the English /v/ sound as /b/, since to them, the sound /v/ and /b/ sound exactly the same. In other positions, they may pronounce it as a bilabial fricative, a sound that does not exist in English; as a result, to a native English speaker, this bilabial fricative may sound like a /w/. For example, “vote” is pronounced as “boat” and “rove” as “row” (p. 101).



Furthermore, Spanish speakers of many dialects substitute the sounds /j/ and /zh/ for /y/, for example, they pronounce the word “use” as “juice”. In the word “beige,” the /zh/ sound is also replaced by /y/ (Avery and Ehrlich, 1987, p. 102). Moreover, native Spanish speakers may pronounce /z/ as /s/, since the /z/ sound is a positional variant of /s/ in Spanish. For example, in words such as “zoo” and “amazing” the /z/ sound would be pronounced as /s/ (p. 102).

In addition, Youman (2014b) claimed that Spanish speaking students often have difficulties pronouncing the English /r/. This occurs because Spanish has more than one /r/ sound, while English has only one. In order to produce the English /r/ sound, the tip of the tongue curls backward behind the alveolar ridge “a small protuberance just behind the upper front teeth that can easily be felt with the tongue” (Ladefoged, 2014, Articulatory Phonetics, para. 2), so the air curls over it. Consequently, the difficulty appears when students need to substitute a trilled /r/ (Spanish “r” sound) for the English /r/ (Youman, 2014b, pp. 67-68).

In addition, there is a struggle in differentiating and producing the sounds /d/ and /th/. These sounds are positional variants in Spanish; as a result, Spanish speakers substitute /th/ for /d/ between vowels and at the end of a word by producing “heather” instead of “header” or “lathe” instead of “laid” (Avery and Ehrlich, 1987, p. 102). Adding to this, the previous authors claimed that Spanish speakers will often substitute /t/ for /th/ in “think” and /d/ for /th/ in “this”. However, it is important to note that a very similar sound of the English /th/ exists in Spanish as a positional variant of /d/, that is, between vowels and at the end of a word; for example, in the words “abogado” or “dedo”. Once Spanish speakers recognize this sound, they begin to pronounce the /th/ sound correctly, without even realizing it (p. 102).

Another common pronunciation error lies on the /h/ sound which is also considered as one of the most difficult for Spanish speakers (Youman, 2014a). The English phoneme /h/ is commonly used as the Spanish letter “h” which is silent; in other words, when Spanish



students see an “h” they tend to make it a silent “h”. Nonetheless, the sound produced for the English phoneme /h/ is usually written in Spanish as “j” or “g” “jarro – gentil” (p. 22).

In addition to single consonant sounds, the consonant’s positions and variety of combinations also cause difficulties in pronunciation among native Spanish speakers. For example, Avery and Ehrlich (1987) claimed that in some dialects of Spanish /m/, /n/ and /ɲ/ can be freely substituted for each other at the end of a word; for that reason, Spanish speaking students may substitute one of these nasals for another at the end of a word. For instance, they may pronounce “sing” as “sin” or “sim” (p. 102). In the same way, Spanish speaking students may substitute the English /ch/ sound for /sh/ as it happens in the word “ship” which could be pronounced as “chip” (p. 101).

Finally, Spanish speakers have difficulty with most initial and final consonant clusters in English, since they tend to add a vowel sound before it or drop the final consonant sound. First, words that begin with /s/ and are followed by another consonant such as in “spit”, “stay”, or “sky” reflect this error. As a result, Spanish speakers tend to insert a vowel at the beginning of the word, for example, "I speak Spanish" is pronounced as "I espeak spanish" (p. 102). On the other hand, words that have final consonant clusters such as “tired” may be pronounced as “tire”, “hold” as “hole”, or “last” as “las”, since students tend to drop the final consonant sound (p. 103).

2.4.2 Vowels. Berg (2013) explained that English vowels tend to be difficult for Spanish speakers because one English vowel has many variations or different forms of pronunciation while Spanish vowels only have one pronunciation for each vowel. Avery and Ehrlich (1987) stated that in English there are tense vowels (long vowels) and lax vowels (short vowels) such as: /ē/ vs. /ĭ/, /ā/ vs. /ĕ/, and /ōō / vs. /ōō/. However, the distinction between tense and lax vowels does not exist in Spanish; therefore, Spanish speakers produce vowel sounds that are between the tense and lax vowels of English (p. 103).

**Table 2***Long vowels vs. short vowels*

<i>/ē/</i>	<i>/ī/</i>	<i>/ā/</i>	<i>/ē/</i>	<i>/ōō/</i>	<i>/ōō/</i>
meat	Mitt	Mate	met	stewed	stood
lead	Lid	Laid	led	Luke	look
sheep	Ship	Waste	west	pool	pull
reason	Rise	Main	men	coed	could

Keddie (2006) mentioned that the /ō/ sound is an unusual sound for Spanish speakers; consequently, they naturally avoid this sound in words such as “phone”, “roll”, and “crow” (para. 6). In addition, Hudson (2013) clarified that the central - neutral vowel “schwa” /û/, as in “hurt”, “early”, “bird”, “worse”, and “prefer”, is often mispronounced by Spanish speakers because there is no similar vowel sound in Spanish (para. 6). Finally, when referring to vowels, Spanish speakers tend to mispronounce the most common sound in English, that is, the weak vowel “unstressed schwa” /ə/, which can be spelt with any vowel (a, e, i, o, or u) and is never stressed (para. 7). This sound is often mispronounced since, as Hudson (2013) explained, Spanish is a syllable-timed language, which means that every syllable is stressed; therefore, Spanish speakers often tend to stress every syllable in English as well (para. 7).

2.4.3 Stress and Aspiration. Avery and Ehrlich (1987) claimed that Spanish is a language that always has word stress, since most words are stressed on the second or last syllable; for that reason, Spanish speakers require a lot of practice in placing stress on different syllables other than the second or last, or not placing stress at all (p. 104). On the other hand, stress in English involves choosing certain syllables (normally only one or two) to stress, which means that the vowel sounds in the remaining unstressed syllables become weak or shorter. For example, in the sentences “I’d **like** to have a look at the **report**” or



“**What** do you think about the **weather**?” (para. 17). In addition, Gutierrez (2001) stated that “the stressed/unstressed syllable durational ratio is significantly greater in English than in Spanish. The mother tongue-biased perception of such ratio could be behind the misperception of the duration of English unstressed syllables by Spanish native speakers' ears” (p. 108).

Regarding aspiration, Youman (2014b) stated that aspiration is a small puff of air produced in the mouth by building up pressure before the release of a stop sound. As claimed by Hudson (2013), in English, the sounds /p/, /t/, and /k/ are normally aspirated at the beginning of a stressed syllable while in Spanish, they never are; consequently, Spanish speakers tend to not aspirate the voiceless stops /p/, /t/ and /k/ in word-initial position, like in the words “**p**ark”, “**c**ar”, or “**t**own” (para. 14). However, the University of Manitoba (2005) maintains that the presence or absence of aspiration will not change the meaning of English words, although it is considered as odd pronunciation.

2.5 Methods for teaching English Pronunciation

Teaching pronunciation is one of the biggest challenges that English language teachers face due to its complexity and variations, according to Oxford University Press ELT (2015),

Helping learners improve their English pronunciation is a challenge for all EFL teachers, native and non-native speakers. English has so many unusual spellings, borrowed words and unpredictable pronunciations that even the most dedicated learners and patient teachers can find it tough to make good progress in this area. (para. 1)

Developing explicit methods and activities aimed to deal with English pronunciation are likely to benefit this demanding task. Arimilli, Kanuri, and Kokkirigadda (2016) presented a list of methods for teaching pronunciation as follows:



2.5.1 Naturalistic method. According to this method, learners are not pressured to imitate the target sound, they simply listen to the sounds presented, and after a while, they are asked to repeat the sounds they heard in the same way. Speech shadowing “an experimental technique of repeating the text immediately after listening to it” (Bilingua, 2018, para. 3) is one of the most famous techniques used in this method (p. 110).

2.5.2 Phonetic transcription method. This is a time tested method to teach pronunciation where L2 learners are given a detailed description of the standard phonetic alphabet and other rules of pronunciation. These codes are not easy to use, so it requires a lot of attention and hard work from the students. Once the learner becomes aware of the phonetic alphabet, he/she can learn the pronunciation of new words by referring to a standard dictionary (p. 110).

2.5.3 Minimal pair drills method. A drill is used in a classroom as a technique to practice a new language. In order to perform a drill, the teacher models a word or a sentence and the learners repeat it (British Council, 2006, para. 1). In the minimal pair drill method, first the teacher makes the students understand the basic patterns of each and every sound in the target language. Then the teacher selects the two words which differ by a single sound and drills them continuously in the class. These pair of words are known as minimal pairs which are defined by McMahon (2002) as “the pairs of words differing in meaning, where the only difference in sound is that one has one of the two phones at issue where the other has the other: tall and call” (p. 16). These drills improve students’ listening perception and oral production, some examples of minimal pairs are: ship /shĭp/ vs. sheep - /shēp/, zip - /zĭp/ vs. zeep - /zēp/, and pen - /pĕn/ vs. pan - /păn/ (Arimilli, Kanuri, and Kokkirigadda, 2016, p. 110).

2.5.4 Sentence drills or contextualized minimal pairs. In this method, Arimilli, Kanuri, and Kokkirigadda (2016) mentioned that students listen to a sentence with words



that sound similar but differ in meaning. As a result, students learn the different meanings of these words through context, for example, “Are you the **least** in the list? (ɑ:(r) ju: ðə **li:st** in ðə **list?**)” (p. 110).

2.5.5 Visual reinforcement. This is considered the silent way of teaching pronunciation, since it only uses word charts, color rods, pictures, props, or sound color charts in order to enhance the comprehensibility of the words. The teacher communicates with students mainly through gestures, allowing students to speak more in the class. Sound charts are prepared by placing vowels on the top and consonants at the bottom. Then, pure vowels are represented in a single color and diphthongs in two colors. In addition, stress patterns can be easily understood by the students by preparing a chart with marked stress syllables. Usually, the stress patterns are represented by a dot below them or stress syllables are capitalized. This method is more suitable with adult learners rather than drills and rhymes which are more suitable for children (p. 111).

2.5.6 Vowel shifts and stress shifts drills. A method that consists on drilling stress shifts and vowel shifts, for example, vowel shifts like rid - /rĭd /, read - /rēd / or stress shifts, like record - /rĕk’ərd /, record - /rĭ-kôrd’/. In the second example, we have both, vowel shift as well as stress shift (p. 111).

2.5.7 Tongue twisters. There are many tongue twisters in English that can help L2 learners enhance their language comprehension as well as their pronunciation. Students become familiar with the sound patterns of the target language by practicing tongue twisters, for example, “Betty bought some butter, but the butter was bitter, she mixed the bitter butter with the better butter to make the bitter butter better” (p. 111).

2.5.8 Reading out loud. This is a technique in which learners are asked to read a passage or poem with correct intonation and stress. This gives the teacher an opportunity to correct students inside the classroom as immediate correction prevents learners from



forming false notions on pronunciation (p. 111).

2.5.9 Recordings. Finally, in this method learners listen to audio clips and are asked to record themselves reproducing the same audio clip. Nowadays, a variety of software is available to carry out this specific method (p. 111).

2.6 Tips for teaching Consonants, Vowels, and Stress

Considering all the common pronunciation errors referred to above, there are specific tips that have been proposed as techniques in order to make students reach proficiency in English pronunciation. These techniques address problems with consonants, vowels, stress, and aspiration.

Avery and Ehrlich (1987) mentioned some tips for dealing with pronunciation problems which are commonly present in Spanish speakers. For the sounds /b/ and /v/, teachers need to exaggerate the differences in articulation between /b/ and /v/. First, show the closure of the lips for /b/ and the contact between the upper teeth with the lower lip for /v/. Later, by contrasting /b/ and /v/ with minimal pairs may also help students perceive the differences between these two phonemes (p. 101). The Sound of English (2018) states that /b/ is a plosive sound, this means that the speaker has to block the air fully with both lips and then release it. On the other hand, the /v/ sound is a fricative sound, where the speaker has to squeeze the air between the top teeth and lower lip. Another difficulty is presented with the /y/ sound; here, students can repeat words such as *yet* or *yes* with the vowel + consonant /ēy/: “iiyyet” or “iiyyes”. In addition, the teacher must tell the students that the tongue should not touch the hard palate in the pronunciation of /y/ (Avery and Ehrlich, 1987, p. 102).

The mentioned authors also focused on teaching the English /r/ sound which can be done by pointing out that the sound is made with the tip of the tongue curled back and not touching the alveolar ridge (p. 92). As for the sounds /d/ and /th/, they are positional variants in Spanish which is why it is quite difficult to make students aware that they are substituting



/th/ for */d/*. For this, it is necessary to state that */d/* is a tooth ridge sound and should not be produced with the tongue touching the teeth. When students are having difficulty producing */th/* in English, the teacher should make them aware that the letter “d” in Spanish words such as abogado “lawyer” or dedo “finger” is pronounced as */th/*. As a result, students accustom to pronounce */th/* in words such as: “this”, “the”, and “then” (p. 103).

While dealing with certain consonant combinations such as */sh/*, it would be helpful to have students produce a prolonged “ssshhh”. The teacher should first make sure that the students’ lips are rounded while producing this sound and then have them transfer this sound to the appropriate words: “ssshhhhip” or “waaasshh”. Similarly, having students lengthen the */s/* sound when it occurs before another consonant, for example, “sssssspeak” helps them avoid placing the */ě/* sound before it (p. 102).

When students practice pronouncing final consonant clusters, it is recommended to do so by using two words. Avery and Ehrlich (1987) mentioned that in order to practice the final cluster */ld/* as in “field”, use the phrase “feel down”. The students can gradually eliminate more and more of the second word: “feel down – feel dow – feel d – field” (p. 90).

Additionally, students can practice final consonant clusters through the addition of grammatical endings, this will help them to understand the importance of such clusters in conveying meaning. For example, by contrasting the following two sentences: “I watch a lot of T.V.” vs. “I watched a lot of T.V” (p. 90). As mentioned above, minimal pairs or triplets in comprehension and production exercises may also be helpful for final consonant clusters (p. 91).

After teaching the meaning and difference between tense and lax vowels, students may find it easier to distinguish them by using minimal pairs. Activities should include recognition and production activities; furthermore, it is a good idea to have students move through the entire set of front vowels: */ē/* - */ĩ/* - */ā/* - */ě/* - */ǎ/*. Performing this several times can



make students feel the mouth gradually opening as the sequence is produced (p. 85). With the sounds /ẽ/ and /ã/ it often helps if the teacher demonstrates the contrast between /ẽ/ and /ã/ by exaggerating the dropping of the jaw with /ã/ (p. 86). On the other hand, for back vowels the teacher should make sure that students maintain their lips rounded and pretend to be stretching an imaginary elastic band (p. 84).

According to Rippel (2018), applying the procedure “pronounce for spelling” while learning to pronounce words that have schwa sounds assists students to become aware of the vowel sounds that take on the schwa sound. This is a simple technique in which students “over-pronounce” all the syllables, allowing them to clearly hear the vowel sounds. For example, in the word “cabin”, the second syllable is unstressed, so the “i” takes on the schwa sound making it indistinct which vowel to use for spelling. When students over-pronounce the word as “cab-IN,” it becomes clear that the letter “i” is used to spell the word (How to Teach Schwas, para. 3).

Avery and Ehrlich (1987) also mentioned that the voiceless stops /p/, /t/, and /k/ are pronounced with aspiration; therefore, a good way to begin teaching aspiration is to make the students aware that aspiration is a puff of air that accompanies the release of the consonant. This can easily be demonstrated with a match or a piece of paper using the consonant /p/. First, students should hold a piece of paper close to their mouth and say the word “pot” while making sure that a burst of air blows the paper away from them. This procedure may be repeated with /t/ and /k/ sounds even though the /k/ sound is less amenable to this type of technique because the air has very little force left by the time it reaches the lips. However, once the students have understood exactly what aspiration is, they can quite easily aspirate /k/ (p. 88).

Finally, while dealing with stress, students should be able to visualize what they are saying. For example, students that see related sets of words that display different stress



patterns can practice shifting major stress (p. 93).

● Photograph	● Photography	● Photographic
------------------------	-------------------------	--------------------------

Figure 1: Stress patterns for practicing shifting the major stress.

2.7 Technology and English Pronunciation

M. Hismanoglu and S. Hismanoglu (2010) stated that language teachers have adopted a traditional way of teaching pronunciation, this is, making use of: the phonetic alphabet, transcription practice, diagnostic passages, recognition and discrimination tasks, drills, short readings, tongue twisters, and recitation. In addition, Thakur (2015) mentioned that traditional methods and tools for pronunciation teaching are becoming outdated and replaced by the spread of computers, laptops, smartphones, and high speed internet. This expansion not only motivates students to learn, but also helps teachers monitor and track their progress effectively (p. 1).

There are many opportunities for L2 learners to practice English through the use of technology. According to Wallace and Lima (2018), technology helps L2 learners identify differences between their pronunciation and authentic foreign pronunciation in focused speech and extended discourse. Listening to recordings of their speech allows English language learners to analyze their pronunciation in greater depth than when speaking in real time. This can be achieved by using audio or video recordings, imitation and analysis, or speaking with native English speakers through computer software and apps (p. 1).

2.7.1 Mobile Applications and Pronunciation. To comprehend the contribution of mobile applications to the phonetics field; first, it is necessary to define the term “Computer Assisted Language Learning” (CALL). Davies (2002) asserted that CALL is often perceived as an approach to language teaching and learning in which a computer is used as an aid to the presentation, reinforcement, and assessment of the material to be learned by usually



including a substantial interactive element. Adding to this, Busa (2008) mentioned that CALL applications promote both language learning objectives and overcome traditional language classroom constraints. As a result, the goal of CALL systems is to provide learners with private, stress-free practice with individualized and instantaneous feedback on pronunciation (p. 165).

According to Demenko, Wagner, and Cylwik (2010), there are advantages while using CALL: the elimination of time limitations, dependence on the teacher, the possibility to work at the user's own pace, and the opportunity to store the learners profile in order to monitor their progress. This can also eliminate stress or frustration, since the learner is being listened to by his/her classmates rather than an authority figure, the teacher (p. 310). Finally, it is remarked that CALL allows constant access to a number of additional materials such as visualizations, recordings, and animations (p. 310).

As asserted by Roy (2017), "the world is at our fingertips and a student can get access to any information from anywhere. Every mobile app has a unique feature which offers its own set of services" (para. 1). The Brock News (2012) explained the importance of using mobile applications for pronunciation purposes. They began by stating that the focus of these tools is to help non-English speakers hear the differences between English sounds better so that they are equipped to monitor their own speech. This will help improve the intelligibility of their spoken English, which in turn, promotes more successful communication. In addition, they sustained that learners who can process speech sounds more accurately also tend to be more fluent and have better listening, comprehension, and vocabulary scores (para. 4).

When students have continuous access to authentic pronunciation, their motivation to reproduce such material in the same way begins with intense trials of practicing.

"Making pronunciation visual, as well as aural, can make a huge difference in students



‘getting it,’ and being motivated to improve” (Oxford University Press ELT, 2016, para 3).

The Brock News (2012) insisted that if learners only have a few examples of the sound they are trying to learn, the recognition of the sound when produced by other speakers is not going to be easy (para. 8).

Roy (2017) confirmed that mobile applications created specifically for educational purposes have contributed in making the learning process fun and easy by provoking a great level of students’ engagement. He has insisted that learning styles, abilities, and even learning paces have been altered over time, since students have taken up modern ways of learning through mobile applications (para. 11).

2.7.2 Online Forums. “Feedback” is an educational term that has to be mentioned in the development of this thesis since it has been verified that it helps students become aware of the gap between the actual and desired performance by providing a space for self-reflection and motivation to improve (London Deanery, 2012, para.2-3). The Education Endowment Foundation (2018) defined feedback as information given to the learner and/or the teacher about the learner’s performance, in relation to learning goals. It redirects either the teacher’s or the learner’s actions to achieve a goal by aligning effort and activity with an outcome. When pairing-up feedback with technology, the University of Sheffield (2016) concluded that new technologies can enhance feedback processes by offering options for short audio feedback responses to students or online peer assessment by students.

While using technology during the learning process, feedback usually appears on forums, which are places where users share thoughts, ideas, or ask and answer questions about a topic by posting text messages. “Forums are not considered the same as chats since it is almost never live and can be read at any time” (Computer Hope, 2017, para. 1). In addition, Lieuw (2014) explained that online forums allow students and teachers to communicate by presenting discussion topics, being part of it at their own pace, and



contributing individually. Additionally, participating in an online forum enables certain students to enhance their communication problems.

2.7.3 Disadvantages while using Technology. According to Beckett (2015), there are some drawbacks while using technology as an educational tool. To begin with, the author has sustained that the use of technological tools during class turn students into inefficient learners since they know that everything that is lectured in class can be later looked up at home; therefore, students become inattentive in class or even miss class. For example, the author explained that many students navigate websites to find the shortest and easiest way to solve a math problem rather than solving it themselves while practicing what was taught during class. In addition, the author noted that using technology during class can lead to wasting valuable time because there may be problems such as connectivity or server errors, which takes a lot of time to solve. Furthermore, many websites contain incorrect information that has been copied and pasted from other sources without checking its authenticity. Therefore, students are misguided and this can provoke serious obstacles in their development. Last but not least, Beckett mentioned that teachers who implement technological learning tools in their classrooms on regular basis take the risk that not all of their students have the income to sustain such implements. Consequently, those students that do not manage to have technology at their fingertips everyday may be unaware of the basic technological skills that have been apprehended by other students at a very early stage (para. 4).

2.8 Conclusion

As it can be seen, determining the most common difficulties among native Spanish speakers while learning American English pronunciation has assisted authors to promote methods and tips dedicated to these faults. Applying these methods in EFL classrooms may show an increase in students' performance during the perception and production of certain



English sounds. Furthermore, it cannot be ignored that technology has proved to be useful and efficient, even though the use of it may have its drawbacks. In addition, online forums have become the home for feedback activities which enhance students' learning process and develop a conscious evaluation of progress among students and teachers. From all that was stated above, it seems that proposing innovative methods, tips and tools for teaching/learning pronunciation that are based on the results of research can lead to an enrichment and noticeable improvement in the pronunciation field.

2.9 Literature Review

English pronunciation teaching has been dealt with a variety of methods that have shown to have effectiveness on students around the world. These methods involve tools such as, new software, mobile applications, or tests that seek students' awareness of certain pronunciation patterns. These meaningful evaluations, along with eliciting common errors and difficulties among foreign speakers, both contribute to a significant insight on what problems need to be addressed. Research has been done in order to enrich pronunciation teaching, and to respond to students' and teachers' troubles while dealing with English pronunciation. A variety of authors have highlighted a selection of methods and tools teachers use and prefer while dealing with pronunciation. The urge to deal with these pronunciation errors has led teachers to search for new and innovative instruments that aid students' difficulties and engagement with learning. This section focuses on studies that have addressed different approaches while teaching English pronunciation, others that have elicited the most common mistakes in pronunciation among non-native English speakers, and finally, those that have exposed the influence technology and mobile phones have on pronunciation teaching learning.

2.9.1 Approaches while dealing with teaching English pronunciation. In a study carried out in Uruguay (Couper, 2016), fluent English language teachers were interviewed



in order to discover their reflections on their professional practice, their knowledge on the subject, beliefs, and practices. This article reveals the perceptions and preferences that 28 English language teachers (25 females and three males) had while dealing with teaching English pronunciation. These interviews were handled in a natural, non-artificial way; in other words, with spontaneous conversation. During this conversation, teachers exposed how they managed their professional practice as English language teachers, what their knowledge on the subject was, and what their preferences were while teaching English pronunciation. Among these preferences, there was the exclusive focus on teaching phonemes and explaining the different forms of articulation in order to understand the mechanics of producing individual sounds and the different speech patterns that occur in English. To other teachers, however, focusing on effective oral communication was their opening to a valuable approach; this means, concentrating first on features such as intonation in the creation of meaning (p. 47). As mentioned by Bhutia (2015), intonation conveys differences of expressive meaning (surprise, anger, wariness, etc.) by varying the pitch level of the voice. In English, for example, stress and rhythm are also part of intonation (para. 1).

Surveys have also been conducted to determine how teaching pronunciation in adult ESL programs is handled. For instance, Foote, Holtby, and Derwing (2012) surveyed 159 instructors and program coordinators from Alberta, British Columbia, and Ontario in Canada. These participants were mostly females, in their 40s or 50s.

This research aimed to discover to what extent pronunciation instruction was being incorporated into the curricula, as well as the approaches and materials that were being used by instructors and program coordinators across Canada. The survey contained 45 questions regarding the participants' and ESL programs' background information the different training opportunities available, resources and activities used, preferences among methods and



instructions while teaching pronunciation.

From the surveys, it could be concluded that teachers were aware of the fact that a small portion of class time is actually dedicated to pronunciation teaching. They claimed that they rarely included pronunciation instruction or corrected pronunciation errors. The authors also revealed that “When asked about the inclusion of pronunciation materials, only 56% of respondents acknowledged that they incorporated pronunciation texts in addition to their regular ESL textbooks” (p. 16). Based on the results mentioned, it can be stated that pronunciation teaching/learning materials other than the common texts are not actually used on normal basis; therefore, this study prompts the evolution of pronunciation teaching by replacing pronunciation methods and materials that have been used for decades.

2.9.2 Eliciting common Mistakes. Mora and Fullana (2007) conducted a study at the University of Barcelona, Spain to find out about the perceptions and production of the English contrasts /i:/- /ɪ/ and /æ/ - /ʌ/ by 49 Catalan/Spanish advanced learners of English (33 females and 16 males, mean age 21) who varied in their starting age of FL (foreign language) learning and FL experience. Some participants began to learn English either in their early childhood (in primary school or in secondary school) and had no extra exposure to the language. Others, aside from learning English through classroom instruction, had access to extra exposure outside the classroom (p.1613).

In order to obtain the learners’ English vowels and consonants perception and production, two tasks were used. The first one was a categorical ABX consonant discrimination task which according to Music Production Glossary (2018) consists of three sections: section “A” is the original audio source, section “B” is the original audio source with some modification to the signal path or sound quality, and section “X” is the audio that is the same as either “A” or “B”. The second task was a Delayed Sentence Repetition (DSR), which was administered individually in a sound-proof booth. The participants heard



the dialogues over headphones and then were asked to say what they heard, while being recorded. These recordings were later computer-edited for acoustic analysis (Theodorou, Kambanaros, & Grohmann, 2017, para. 1).

Mora and Fullana (2007) analyzed the results on the AXB discrimination task and claimed that “neither starting age (early childhood, primary, and secondary school start) nor experience (school exposure and extra exposure) had a significant effect on the correct discrimination scores for the two vowel contrasts” (p. 1615). In spite of this, late FL learners (secondary school) tended to distinguish /i:/- /ɪ/ and /æ/ - /ʌ/ at higher correct rates than early starters (early childhood and primary school). In addition, Catalan/Spanish speakers with no extra exposure outside school perceived vowel contrasts more accurately than those learners with a higher amount of experience. This unexpected finding might corroborate previous research conducted in both formal and naturalistic settings (p. 1615).

As for the DSR task, participants’ final scores demonstrated that students who did not start to learn English in primary or secondary school and had no extra exposure to the language outside the classroom could not contrast and produce the sounds /i:/- /ɪ/ and /æ/ - /ʌ/ correctly. The authors proposed that experience effects should be further investigated by obtaining rather equal size groups and by addressing input quality rather than quantity (p. 1616).

Furthermore, a study carried out in Japan by Saito (2007) presents a research-based experiment that provides tangible evidence that Japanese learners of English improved their speech production greatly. Among the participants there were six graduate Japanese learners of English (from Syracuse University) who had been in the United States between two and seven months, with a mean age of 26 years old. Four of the Japanese students made up the experimental group that was given phonetic instruction through computer generated visual feedback (IPA symbols and demonstration of tongue movements). An acoustic speech



analysis method was adopted with the computer software “Praat”; that is, “a freeware program for the analysis and reconstruction of acoustic speech signals” (Boersma and Weenink, 1995, para. 1). Additionally, Saito (2007) mentioned that Praat allows the instructor to assess learners’ improvement objectively. On the other hand, the other two students in the control group had no instruction. The results demonstrated that computer-based phonetic instruction effectively provided students with ongoing feedback, which contributed to the improvement of their speech production (pp. 34-35). Explicit phonetic instruction helped these Japanese learners of English significantly improve their segmental phonology in the case of a low front vowel /æ/, since it helped learners become more aware of tongue movements while producing English sounds (pp. 34-35).

These results also showed that Japanese learners of English seem to not separate two demarcated phonetic categories (/ɪ/ and /æ/), which caused intelligibility problems, even though they were advanced learners of English.

There have also been studies that concentrate on gathering the difficulties while producing English vowels. For instance, in Iraq, two different groups of subjects were recruited for a study conducted by Al-Abdely and Yap (2016). The first group consisted of 20 Iraqi EFL learners and the second group of 20 Iraqi English teachers (recruited from three different departments in the University of Anbar: The Education College for Women, the College of Education for Human Sciences and the College of Arts). The 20 Iraqi English teachers, completed the teacher/self-reported assessment questionnaire which aimed to identify, according to teachers’ opinions, learners’ difficulties encountered in the perception of vowels. The second group of subjects (students in the English language department from the Education College for Women in the University of Anbar) were recruited for the perception test which consisted of 48 real words, four words for each vowel category. All the words were monosyllabic words, except for the four words used to test the schwa sound.



The test results revealed that Iraqi EFL learners had difficulties mainly while producing two vowels categories /ɒ/ and /æ/ and that the perception of the vowels /ɒ/, /ʌ/, /ɪ/ and /ɔ:/ encountered most difficulty. In addition, the insights of Iraqi teachers on which sounds were the most difficult for their EFL learners differed from the actual data revealed since, as these authors claimed, there is usually no conscious awareness of phonetic rules among teachers (p. 13). As a result, Al-Abdely and Yap (2016) claimed that in general Iraq teachers and students believe that English vowels are not easy to learn (p. 13).

2.9.3 Pronunciation Improvement through technology. A classroom study by Kennedy and Trofimovich (2010) was conducted at an English-medium university in Montreal, during a 13-week pronunciation course directed by an experienced pronunciation instructor. The class, which had only ten students, met once a week for three hours. “The course content featured exclusively suprasegmental aspects of English pronunciation (i.e. thought groups, word stress, rhythm, sentence stress, and intonation)” (p. 173). The assignments during the course concentrated on elevating students’ awareness of English pronunciation patterns in order to improve their fluency and intelligibility in the foreign language. The course required native speech analysis, daily journal writing, weekly language use logs, presentations or 10 minute talks on a topic, and completing language lab assignments using the CAN-8 Virtual Lab software (1990). This latter resource allowed participants to listen to authentic English speech and later, record him- or herself speaking (p. 174).

Results showed that the more qualitative language awareness comments the students had in their journals or analysis, the higher their pronunciation level grew at the end of the course. Also, it was settled that the more opportunities the student had for being in touch and exploring fluent target speech, the more they gained language awareness. Therefore, Wennerstrom stated that “L2 teachers who are targeting learners’ pronunciation, should



consider strongly encouraging learners to seek out opportunities outside of class to hear fluent L2 speech” (as cited in Kennedy and Trofimovich, 2010, p. 183).

While dealing with English pronunciation, computer-assisted methods are also considered as a resource. Tanner and Landon (2009) conducted a research where they evidenced the effects of computer-assisted pronunciation readings on ESL learners. These readings exclusively considered the use of pausing, stress, intonation, and overall comprehensibility. Seventy-five ESL learners enrolled full-time in a university ESL program. They were all of intermediate-level proficiency and ranged in age from 17 to 54. They all had spent between one week and two years in the United States. The participants reported having previously studied English between two months and 17 years, with the median being four years. The participants’ native language backgrounds were organized into three categories: Asian language speakers (e.g., Japanese, Chinese, Korean, n = 36), Romance language speakers (e.g., Spanish Italian, Romanian, n = 34), and other languages (e.g., Haitian Creole, Russian, Armenian, n = 5).

The participants completed a sequence of seven computerized tasks that lasted 20 minutes: five spontaneous speech tasks, one perception task, and one controlled production task. These tasks provided empirical evidence that supported the idea of using oral reading techniques for pronunciation improvement. Some participants significantly improved their awareness of pausing and word stress and sentence-final intonation. “The treatment group significantly improved their perception of pausing and their production of word stress with limited exposure to the available treatment (11 weeks, 10 min. per day) by using self-directed, computer-assisted cued pronunciation readings” (p. 61). Overall, the results showed that self-directed computer-assisted and practice procedures helped ESL learners improve pronunciation by practicing perception abilities (pausing and word stress) and production abilities (in word stress).



There are also studies that have been developed to highlight the potentials and effectiveness of using technologies as a teaching instrument in contrast with handouts. For instance, the research carried out by Saran, Seferoglu, and Cagiltay (2009) focused on defining the effects of using multimedia messages via mobile phones, while dealing with English pronunciation. Twenty-four students attending the English Preparatory School of an English-medium university in Turkey were the participants of this study. They were selected based on the data collected through a pre-study questionnaire which included items related to their demographic information, their mobile phone ownership and use, and their access to internet on daily basis.

The participants were divided into three groups. One group had instruction through mobile phones, the other through web pages, and the third group through handouts. Results revealed that students who sent multimedia messages via mobile phones encouraged their regular study behavior, causing a positive effect on their pronunciation learning. Based on these results, researchers claimed that the delivery of foreign language vocabulary study materials, such as multimedia messages via mobile phones, may lead to better pronunciation of words. Furthermore, learners might be able to use any previously wasted time (on the bus, on their way back and to school) on learning languages with the chance of repeating the mobile content as many times as they want conveniently, since the words would be at their fingertips on their mobile phones (p. 110).

2.9.4 Mobile Pronunciation Learning. Teachers in the United States have considered mobile learning as a productive and effective tool while dealing with English pronunciation. Oz (2014) conducted a research where a total of 144 prospective English teachers (from 21 to 29 years old) at a large state university in Ankara – Turkey volunteered to participate in a study intended to discover English teachers' perspective, usage, and limitations while including mobile learning technology in their teaching. These insights



were compiled through a self-report questionnaire of twenty-one questions which consisted of two parts. The first part included some questions that characterized the participants in gender and age. The second part comprised twenty-one questions that enquired their current ownership, usage, and purchase intent of mobile devices, as well as their perceptions of barriers while using mobile phones in their language teaching. The results exposed that most teachers and instructors owned mobile devices and use technology on a daily basis (smartphones, lab tops, internet, MP3 players, and tablets). However, it was stated that there were still impediments while using mobile technology in the learning process:

It was concluded that there are still continuing obstacles to the use of ever changing mobile technology in language learning across the country. The cost of a tablet or a laptop, for example, may be preventing some students from owning one. The versatility of the mobile devices may also add to the dilemma of mobile learning.

Lack of connectivity to the internet, lack of training and reasonable pedagogical justifications for mobile language learning, may cause the programs not to live up to their objectives, leading to total frustration. (p. 1039)

In general, the responses showed that students and instructors are not ready to employ mobile technology with adequate ease and functionality. Teachers at this university are in touch with technology, but including such devices in the learning process is what causes difficulty and rejection.

Even so, the effectiveness of smartphones while helping ESL college students learn English vocabulary was demonstrated through a study conducted in China by Wu (2014). The study included fifty sophomore college students in one class at Jiujiang University of China, between the ages of 20-23. They were randomly divided into two groups. Twenty-five students were in an experimental group and twenty-five students were in the control group. The smartphone itself was not the implement, but a Java application designed by the



author. Java “is a programming language and computing platform” (Java, 2014). This software program contains 852 English words with their graphic diagrams, spelling, pronunciation, meaning in the Chinese language, a synonym, an antonym, part of speech and an example of the word used in a sentence.

The participants from the experimental group were asked to download the app and taught how to use it. Results showed that students using the app for word learning outdid those who did not. It was concluded that the use of smartphones is very effective while building vocabulary for Chinese university EFL students. The purpose of this research was to introduce and prompt a pedagogical example in language learning that helps students improve their vocabulary. The author believes that “most teachers can make their own mobile teaching/learning materials in a similar design” (p. 306).

Including mobile learning while dealing with English pronunciation has become a new trend. For example, mobile assisted language learning through an application in university EFL courses in Japan is already on trial. Researchers Kondo et al. (2012) at universities in Japan explored the use of Mobile Assisted Language Learning (MALL) practices by developing a learning module intended to help improve students’ scores on the TOEIC (The Test of English for International Communication) Listening and Reading Tests. The aim of this study was to discover whether certain MALL practices would foster an advanced form of self-study and self-regulated learning (SRL).

“In SRL, students take responsibility for arousing and sustaining their own motivation in order to make, carry out, and evaluate strategic learning plans” (p. 170). “Nintendo DS” mobile device was used with a group of participants while TOEIC self-study textbook was used with the other. Eighty-eight first-year students from Kyoto University of Foreign Studies participated in this study. Forty-two of them were included in the MALL group and forty-six students in a control group. All of the participants in both the MALL



group and the control group were also taking two other compulsory and two elective language skill building courses. Five steps of a 30-minute learning module were designed to be used with the “Nintendo DS” mobile device with the MALL group of students while the control group worked a 30-minute learning module designed to be used with a popular TOEIC self-study textbook. Pre- and post-tests were conducted before the course started and at the end of the course.

The MALL project transferred the responsibility of learning from the teacher to the student, since the use of MALL learning module encouraged students to study without teacher monitoring, increasing their levels of satisfaction and achievement. “Our MALL project did improve students’ self-study behavior” (p. 185). It was seen that students spent more time studying outside of class, and therefore, improved their English language skills, that is, “a set of capabilities that allow an individual to comprehend and produce spoken language for proper and effective interpersonal communication” (Morehouse, 2017, para. 1). Even though students increased their self-study time and improved their language skills, teacher monitoring cannot be overlooked:

The educational personal growth which our students experienced, however, was not enough for them to move from a general self-directed form of self-study to a more sophisticated form of self-study known as self-regulated learning. Once the teacher’s intervention was eliminated, their self-study behavior decreased both qualitatively and quantitatively. (Kondo, et al., 2012, p. 185)

Therefore, the authors of the research concluded that teacher mediation in the learning process needs to go beyond the preparation of MALL study materials (p. 185). In other words, teachers may have to combine MALL with other materials, methods, or tools in order to enhance students’ improvement in the language learning process.

2.9.5 Conclusion. Studies that have been developed with EFL students have



definitely given meaningful revelations on how pronunciation has been dealt with, especially in countries where English is not their native language. The available opportunities for practice, resources, and activities revealed in these studies give us a valuable comparison on how pronunciation teaching is being addressed. In addition, it has been evidenced that certain difficulties in the production of phonemes may lead to intelligibility and that perception abilities among students are essential when dealing with pronunciation. Furthermore, it can be said that even though teachers and students are in touch with technology, including such devices in the learning process is what may cause difficulty or rejection. These innovative learning tools do not only respond to the technological needs of the decade, but also to the urge of increasing self-study behavior which may lead to an improvement in the students' pronunciation skills. Free practice, self-study time, and having the authentic material at students' fingertips are valued reasons that served as motives for this thesis.



CHAPTER III: Research Methodology

The main objective of the present study is to design a wireframe and storyboard of a cellphone application as an educational tool for students of the English major at the University of Cuenca, which intends to deal with the most common pronunciation errors among these students. An exploratory quantitative design was used and the pronunciation errors from 4th semester students taking Phonetics were elicited through a diagnostic test, which was then tabulated to show each errors' frequency.

Exploratory research is a type of research used when a problem is not clearly established in its parameters; therefore, it helps students to understand an issue by selecting the best data collection method (Professor Today, 2018). The focus is also quantitative, since the data is conveyed in numbers, percentages, and rates of recurrence. As stated by Labaree (2018), quantitative research focuses on gathering numerical data to then be able to generalize it across groups of people or to explain a particular phenomenon. Polls, questionnaires, and surveys are usually used for data collection and undergo statistical, mathematical, or numerical analysis.

3.1 Participants and Context

This research, as previously mentioned, looks for common pronunciation errors among 4th semester Phonetics students in the English major at the University of Cuenca. Our participants are exclusively students who are enrolled in the Phonetics class according to the University's academic curriculum, since this is when students begin to work on their English pronunciation.

All participants were native Spanish speakers, among them 29 females and 13 males (total 42), with an average age of 22. Due to class schedule, they were divided into the morning group (24 students) and the afternoon group (18 students). These future English teachers are current students at the Philosophy faculty of the University of Cuenca who



entered the English major without being tested on their English knowledge, in other words there was no way to know their entry level or even if they knew about the English language at all, which is why their English level varies among them.

Additionally, it is important to mention that these 4th semester future English teachers had previously taken subjects in English such as intermediate level Writing, Conversation, Reading and Grammar classes and are currently taking English Phonetics, Masterpieces of English Literature, and Morphology of the English Language.

3.2 Data Collection Instruments

As claimed by Rouse (2016), data collection is the systematic approach of gathering information from a variety of sources to get a complete and accurate picture of an area of interest. It enables a person or organization to answer relevant questions, evaluate outcomes, and make predictions about future probabilities and trends.

The data was collected through a diagnostic test and two surveys. The first instrument (Appendix B) was used to gather pronunciation problems among the students. The test, which was taken from Cook (1991), aims to test pronunciation skills in terms of vowel sounds, consonant sounds, connected speech, and intonation. Since our focus was on vowel and consonant sounds, the test was adapted so that it did not include the sections related to connected speech and intonation. It included 166 words grouped according to the presence of vowels, consonants in word initial and final position, and minimal pairs. Group A contained 42 words which tested students on their pronunciation of English vowel sounds, while group B consisted of 14 words which tested pronunciation of stressed and unstressed vowel sounds. Additionally, group C consisted of 9 words containing vowel + “r” sounds, Group D (75 words) tested minimal pairs on vowels and consonants, and finally, Group E, contained 26 words, which tested students on their pronunciation of minimal pairs that contrasted stop sounds in phrase final position.



In the diagnostic test words such as “bird”, “bit”, “front”, “race”, “say”, “work” and “would” appeared twice because in each group they are an example of a different sound. For example, the word “bird” appears twice in the diagnostic test, however when it appears in group A, it tests the ability to pronounce vowel sounds, while in Group E, it seeks to verify the ability to contrast the “d” and “t” stop sounds in phrase final position. While conducting the diagnostic test, the participants had to read out loud 166 words while being recorded and videotaped.

Aside from gathering the most common errors in pronunciation, our proposal was in need of evidence to support the idea of suggesting a cellphone application as an educational tool while dealing with pronunciation difficulties. For this reason, two surveys were conducted with the participants. The first one (Appendix C) consisted of five questions that determine whether or not they have a smartphone with access to internet, what their methods for practicing English sounds are, and their positive or negative perceptions of actually including a cellphone application as an educational tool.

The second survey (Appendix D) was applied to collect students’ feedback on the application’s prototype after a brief illustration of the application’s wireframe and storyboard. The survey helped to reveal students’ inclination towards including this app as an educational tool, what they were fond of, and their suggestions on what seemed unnecessary.

3.3 Procedure

In order to reach our main objective, which was the creation of the cellphone application, we first collected and analyzed the data and afterwards, based on the results, began to design the cellphone application prototype.

3.3.1 Data Collection and Analysis. In order to reveal the most common pronunciation errors among native Spanish speakers, it was necessary for the participants to take a diagnostic test. This test was applied to 42 students who had to read 166 words out



loud while being recorded and filmed. Afterwards, these recordings were analyzed and evaluated to determine the most common errors in pronunciation. While evaluating each students' test, pronunciation errors were tabulated using Excel and listed in the following way: first came the sound they were expected to make and afterwards came the sound they actually made. For example, if the sound required was short "i" (/i/) and it was pronounced as long "e" (/ē/), then it would be represented as, (/i/ → /ē/).

Each error occurred a certain amount of times and these totals were later organized from highest to lowest, thus, showing which error was repeated the most. In order to appreciate the regularity of the error, each error's total was transformed into a percentage. To do this, we first added all the numbers of errors obtained from the diagnostic test and took that number as our 100%; from there, each error had its own percentage in relation to the total amount of errors in the diagnostic test. As a result, we generated a table (Table 4) that revealed the 11 most common pronunciation errors among native Spanish speaking students.

Additionally, we conducted two surveys in order to have evidence for our proposal; this means, having enough information that shows the feasibility of our cellphone application prototype. The first survey was conducted with 41 out of the expected 42 participants since one of them did not attend class that day. This survey consisted of five questions that inquired whether or not the participants have a smartphone, access to internet, what their modern methods for practicing English sounds are, and their positive or negative perceptions of actually including a cellphone application as an educational tool. The second survey was applied to the 42 participants after a brief illustration of the cellphone's application wireframe and storyboard in order to know students' perceptions about the cellphone application prototype. The surveys' answers were tabulated using Excel and then graphed in order to show the frequency among students' responses.



3.4 Ethical Considerations

Ethical considerations were taken into account during our investigation, since in order to ensure experimental procedures while dealing with human subjects, psychologists follow a code of ethical principles published by the American Psychological Association (CliffNotes, 2016). This requires investigators to obtain informed consent from all subjects, protect subjects from harm and discomfort, treat all experimental data confidentially, and explain the experiment and the results to the subjects afterwards.

To begin, both English Phonetics professors gave authorization to work with their students throughout the semester. In addition, the students were informed about the purpose of the study and the benefits it may bring. Before gathering any data, we obtained an informed consent from all of our participants to ensure that they agreed to be recorded and filmed during the diagnostic test. This informed consent assured participants the anonymity of the data collected and notified participants about the key elements and purpose of the research study.

3.5 Limitations

Along the development of this investigation we can say that there were not many limitations since both Phonetics professors, 4th semester Phonetics students, and our thesis director contributed to facilitate the progress of this thesis. On the other hand, while analyzing data, few audios sometimes distorted the students' pronunciation, however the videos helped us identify the movements and positions of the mouth's organs; therefore, it was easy to recognize which sound was actually produced by the student. Aside from that, we can say that the development of this thesis had all its facilities and no complications.



CHAPTER IV: Results and Discussion

This chapter concentrates on describing the results of the investigation by first highlighting the most common errors in pronunciation among English major students, then the students' accessibility to using a cellphone application as an aid to enhance their pronunciation skills, and finally, their observations on the proposal such as the students' willingness to include a cellphone application as an educational tool and their perceptions on the wireframe and storyboard.

Additionally, this chapter presents a discussion of the findings in light of other published work that can help readers clarify why each error may have occurred among the participants of this study.

4.1 Results: Diagnostic Test

To begin with, the participants took a diagnostic test where they had to read out loud the words that were exposed. This test was cautiously analyzed in order to determine the most common errors among students. While analyzing data, there were certain errors that were not expected, since we were only awaiting errors regarding the correct or incorrect pronunciation of the English sounds, ignoring the modifications and interplays the different functions of oral communication have. However, the results revealed that these factors need to be considered since they affect intelligibility. For example, students frequently avoided the use of aspiration in words such as "player", "poor" or "pure", used intonation and stress incorrectly, or changed words from singular to plural. Aside from this, it was observed that students had problems while reading section E, which contrasted stop sounds in final position. For example, if the first word from the minimal pair was "baid" and the second one was "bait", they would read both as "baid", and paid no attention neither to the distinction



between the final stops “t” and “d” nor to vowel length. These “special cases”, as we named them, presented themselves in minimum percentages, however they are worth mentioning.

Once we obtained the number of times each error occurred, the totals were rated from higher to lower; that way it was easy to identify the most common errors among the participants. The results of this analysis are shown in the following table:

Table 3

Frequency Distribution of Pronunciation Errors

Pronunciation Error	# of Times Repeated	%
/ĩ/ → /ē/	463	19.91%
/d/ → /th/	195	8.38%
/z/ → /s/	133	5.72%
/ē/ → /ě/	119	5.12%
/d/ → /t/	95	4.08%
/t at the end/ → dropped	90	3.87%
/d at the end/ → dropped	90	3.87%
/l at the end/ → dropped	69	2.97%
/ou/ → /ō/	68	2.92%
/ǎ/ → Spanish vowel “a”	57	2.45%
/v/ → /b/	55	2.36%
/t/ → /th/	49	2.11%



vowel + r	43	1.85%
/ā/ → Spanish vowel “a”	39	1.68%
/ũ/ → Spanish vowel “u”	35	1.5%
/ō/ → Spanish vowel “o”	29	1.25%
/v/ → /f/	29	1.25%
/ã/ → /ā/	28	1.2%
/s/ → /es/	27	1.16%
/silent l/ → l at the middle of a word	25	1.07%
/j/ → /g/	22	0.95%
/t/ → Spanish “d”	22	0.95%
/t/ → Spanish “t”	21	0.9%
/th/ → /t/	21	0.9%
/ō̄/ → /ō̄/	20	0.86%
/th/ → Spanish “d”	20	0.86%
/ŋ/ → /g/	18	0.77%
/th/ → Spanish “d”	16	0.69%
/ō̄/ → Spanish vowel “u”	16	0.69%
/s/ → /sh/	15	0.64%



/zh/ → /sh/	14	0.6%
/ĩ/ → /i/	14	0.6%
/oō/ → /ō/	13	0.56%
/k/ at the end → dropped	13	0.56%
/ā/ → /i/	12	0.52%
/g/ at the end → silent	12	0.52%
/b/ → /f/	11	0.47%
/ĩ/ → /ě/	11	0.47%
/ô/ → Spanish vowel “o”	10	0.43%
/d/ → /əd/	10	0.43%
/ə/ → Spanish vowel “a”	10	0.43%
/ě/ → /ā/	10	0.43%
/ũ/ → Spanish vowel “a”	10	0.43%
/ũ/ → /oō/	9	0.39%
/ô/ → /ou/	9	0.39%
/th/ → /t/	9	0.39%
/ā/ → /ũ/	9	0.39%
/th/ → /th/	8	0.34%
/j/ → /ch/	8	0.34%



/ô/ → /ō/	8	0.34%
/ě/ → /ē/	8	0.34%
/ǎ/ → Spanish vowel “o”	8	0.34%
/ũ/ → /ē/	8	0.34%
/ũ/ → Spanish vowel “o”	7	0.3%
/ch/ → /j/	7	0.3%
/t in the middle/ → silent	6	0.26%
/oõ/ → /ō/	6	0.26%
/n/ at the end of a word → silent	6	0.26%
/ō/ → /oõ/	5	0.21%
/ī/ → /ē/	5	0.21%
/v/ → /f/	5	0.21%
/ē/ → /ā/	5	0.21%
/oõ/ → Spanish “u”	5	0.21%
/d/ → Spanish “t”	5	0.21%
/ou/ → Spanish “o”	5	0.21%
/ə/ → Spanish vowel “o”	4	0.17%
/ô/ → Spanish vowel “a”	4	0.17%
/oõ/ → Spanish “o”	4	0.17%



/oo/ → /ō/	4	0.17%
/v/ → /w/	3	0.13%
/zh/ → /s/	3	0.13%
/p/ → /b/	3	0.13%
/oo/ → Spanish “o”	3	0.13%
/zh/ → /g/	3	0.13%
/f/ at the end of a word → silent	3	0.13%
/ě/ → /ē/	3	0.13%
/oo/ → Spanish vowel “a”	2	0.09%
/j/ → /th/	2	0.09%
/j/ → /y/	2	0.09%
/ǎ/ → /ou/	2	0.09%
/ä/ → /ō/	2	0.09%
/ou/ → Spanish vowel “a”	2	0.09%
/p at the end/ → dropped	2	0.09%
/ä/ → Spanish vowel “o”	2	0.09%
/ä/ → Spanish vowel “a”	2	0.09%
/g/ → /k/	2	0.09%
/ō/ → Spanish vowel “a”	2	0.09%



/b/ → /p/	2	0.09%
/ô/ → /ō/	2	0.09%
/r/ → Spanish “r”	2	0.09%
/ũ/ → /ě/	2	0.09%
/ũ/ → /ǎ/	2	0.09%
k in the middle → silent	2	0.09%
/th/ → Spanish “t”	2	0.09%
/ĩ/ → /ī/	2	0.09%
/ä/ → /ǎ/	1	0.04%
/ō/ → /ou/	1	0.04%
/əz/ → /s/	1	0.04%
/l/ → /t/	1	0.04%
/ā/ → Spanish vowel “o”	1	0.04%
/ī/ → /û/	1	0.04%
/ǎn/ → /ǎnd/	1	0.04%
/l/ → /d/	1	0.04%
/ä/ → /ou/	1	0.04%
/ī/ → /ə/	1	0.04%
/ũ/ → /ō/	1	0.04%



/t/ → /ft/	1	0.04%
/õ/ → Spanish vowel “o”	1	0.04%
/ē/ → /ĩ/	1	0.04%
/f/ → /p/	1	0.04%
/ě/ → Spanish vowel “a”	1	0.04%
/zh/ → /j/	1	0.04%
/y/ → /j/	1	0.04%
/sh/ → /ch/	1	0.04%
/th/ → /th/	1	0.04%
/ē/ → Spanish vowel “e”	1	0.04%
Total	2326	100%

**Table 4*****Top 11 - Most Common Pronunciation Errors***

Top 11 Common Errors	# of Times Mispronounced	%
1. /i/ → /ē/	436	19,84%
2. /d/ → /th/	195	8,35%
3. /z/ → /s/	133	5,7%
4. /ē/ → /ě/	119	5,1%
5. /d/ → /t/	95	4,07%
6. /d/ at the end → dropped	90	3,86%
7. /t/ at the end → dropped	90	3,86%
8. /l/ at the end → dropped	69	2,96%
9. /ou/ → /ō/	68	2,91%
10. /ǎ/ → Spanish vowel “a”	57	2,44%
11. /v/ → /b/	55	2,36%
Total number of most common errors	1407	60.28%

**Table 5***Special cases*

Pronunciation Error	# of Times Repeated	%
reads another word	173	43.03%
Incomprehensible	88	21.89%
stress in an unstressed vowel	61	15.17%
No Aspiration p	52	12.94%
does not read the word	18	4.48%
adds an extra sound	6	1.49%
makes it plural when it's not	2	0.5%
does not read the plural	2	0.5%
Total	402	100%



4.1.1 Discussion. The most common errors in pronunciation among the students are related to vowels and consonants. Since, the number of sounds in the English language exceeds the number of letters (vowels, consonants, and combinations of them), a letter, digraph, or any combination of letters could be pronounced surprisingly different in various words. These variations cause confusion among students, since they confuse which vowel or consonant sound should be used (Teacher Finder, 2017). Aside from this, as Saundz (2014) mentioned, students tend to use their mother tongue accent when accommodating to foreign sounds. This can be clearly evidenced in the listed errors concerning vowels. Students commonly pronounce English vowel sounds such as /ĩ/, /ē/, and /ã/ as their Spanish vowel sound equivalents. For example, words such as “milk” or “recent” are not pronounced with the English vowel sounds they require, but rather with the Spanish vowel “i” and “e”; therefore, pronouncing “milk” as / mēlk/ and “recent” as /rē’sənt/. Students normally tend to pronounce the English /ĩ/ sound as the English /ē/ vowel sound, since it is a very familiar sound to the Spanish vowel “i”. Similarly, students commonly pronounce the English /ē/ sound as /ě/, which is also very familiar to the Spanish vowel “e” sound. This can cause misunderstandings since the distinction between tense and lax vowels are crucial for intelligibility (Celce-Murcia, 2010).

Additionally, concerning vowel sounds and students’ accommodation of foreign sounds to their mother tongue, the /ã/ sound and /ō/ are commonly pronounced as the Spanish “a” and “o” vowel sounds respectively. For example, the word “boat” /bōt/ is pronounced with a Spanish “o” vowel sound rather than the English “o” tense vowel sound.

Likewise, consonant sounds were frequently pronounced as they are in Spanish; meaning that, while pronouncing consonants, students also accommodated their mother tongue to pronounce foreign, unfamiliar sounds. For example, native Spanish speakers frequently pronounce /z/, /d/, and /v/ as they are pronounced in Spanish. According to



Gilakjani, Ahmadi, and Ahmadi (2011), this phenomenon occurs since second language speakers have conceptual patterns appropriate to their first language, which are internalized during childhood and turn out to be very difficult to change. To a native Spanish speaker's ear, the letters /b/ and /v/ sound exactly the same even though they are used differently in spelling; therefore, Spanish speakers tend to pronounce the English /v/ sound as /b/. Similarly, students regularly pronounce English sound /z/ as /s/, since in Spanish both /z/ and /s/ sound exactly the same. In addition, there is an apparent struggle among students in differentiating and producing the sounds /d/ and /th/. According to Avery and Ehrlich (1987), these sounds are positional variants in Spanish; as a result, Spanish speakers substitute /th/ for /d/ between vowels and at the end of a word, and thus produce "heather" instead of "header" or "lathe" instead of "laid" (p. 102). This is exactly what happened to our participants since, commonly words such as "body" were pronounced as /bõthē/ or "bird" as /bûrth/.

In addition, the students normally drop the consonant sounds /d/, /t/, and /l/ in word final position. As mentioned by Avery and Ehrlich (1987), Spanish speakers have difficulty with most initial and final consonant clusters in English, since they tend to add a vowel sound before it or drop the final consonant sound. Words that have final consonant clusters such as "tired" may be pronounced as "tire", "hold" as "hole", or "last" as "las" (p. 103). It was very common to hear participants pronounce words such as "rapid", "soul", or "front" as "rapi", "so" and "fron" respectively. These type of errors were even more noticeable when students were asked to read section E which contrasted stop sounds in final position. For example, if the first word was "bird" and the second one was "burt", participants would read both words as "bird", ignoring the distinction between the final stops "t" and "d" and the lengthening of the vowel. According to Jenkins (2000), some features are crucial for intelligibility, therefore, must be taught to non-native learners of English. For instance, aspiration of word- initial



voiceless stops to distinguish words like “pat” nad “bat”, vowel length to difference stops in final position such as “bet” and “bed” and the distinction between tense and lax vowels (as cited in Celce-Murcia, Brinton & Goodwin, 2010).

4.2 Results: Surveys

Two surveys were conducted in order to know students’ opinions regarding the use of smartphones and their observations on the illustrated wireframe and storyboard. The first survey was applied after the diagnostic test during the second month of classes. At this point students were familiarized to what English Phonetics involved and what they would be learning; therefore, they knew what the course required and could decide whether or not to consider the proposal. The survey consisted of five questions and the responses were as follows:

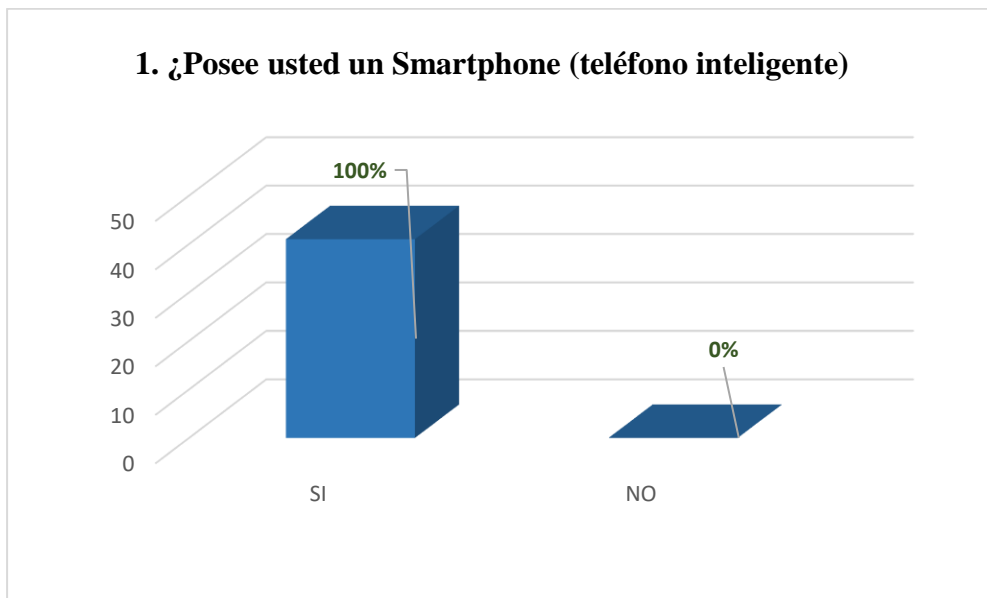


Figure 2. Availability of Smartphones

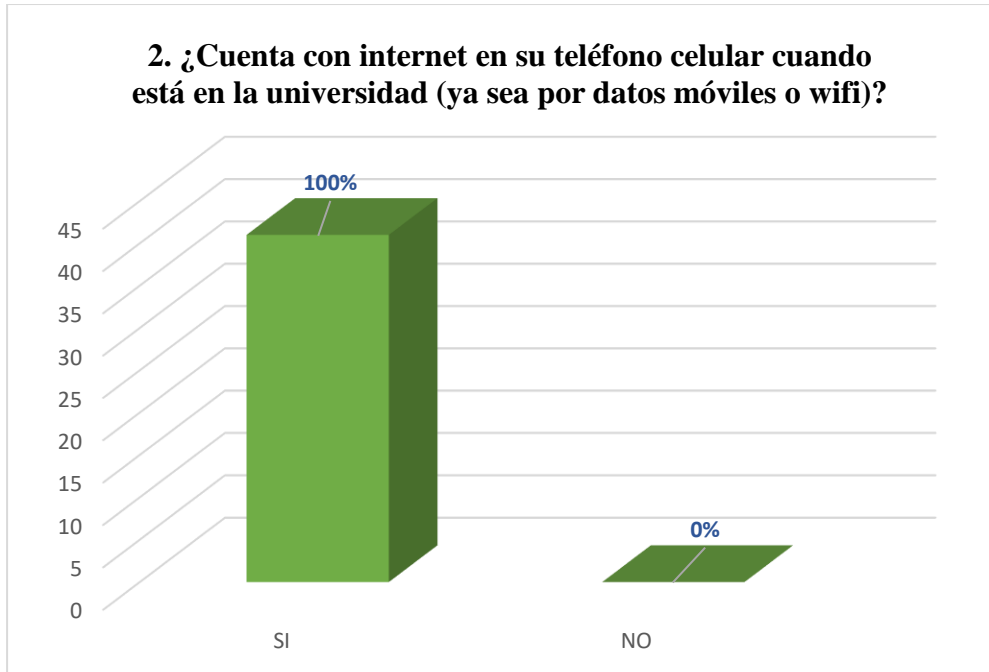


Figure 3. Internet access

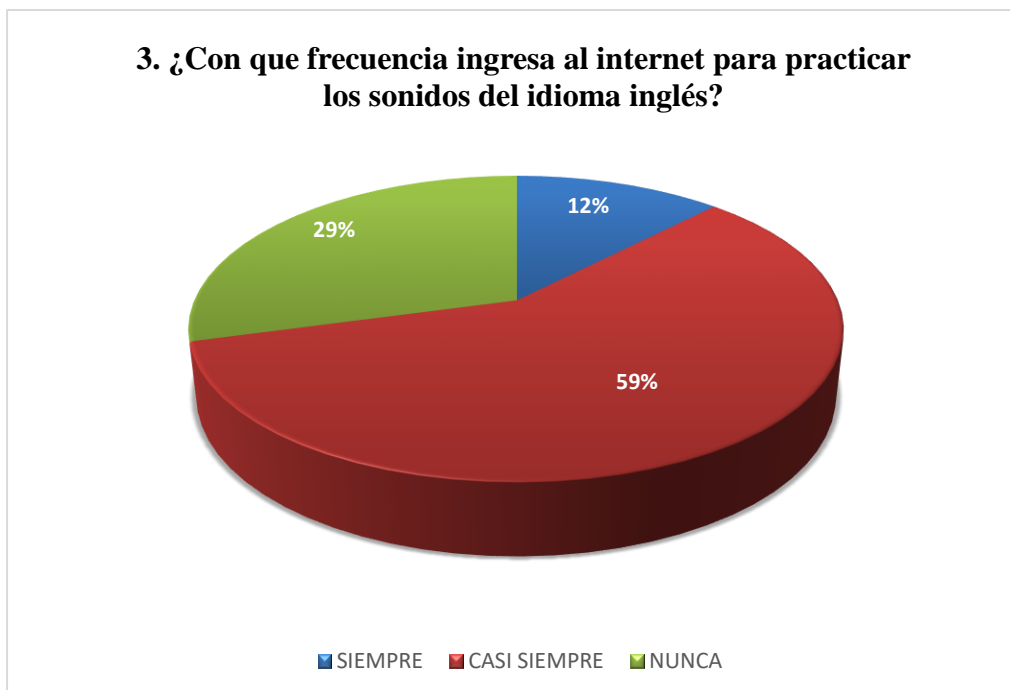


Figure 4. Accessing internet to practice English sounds

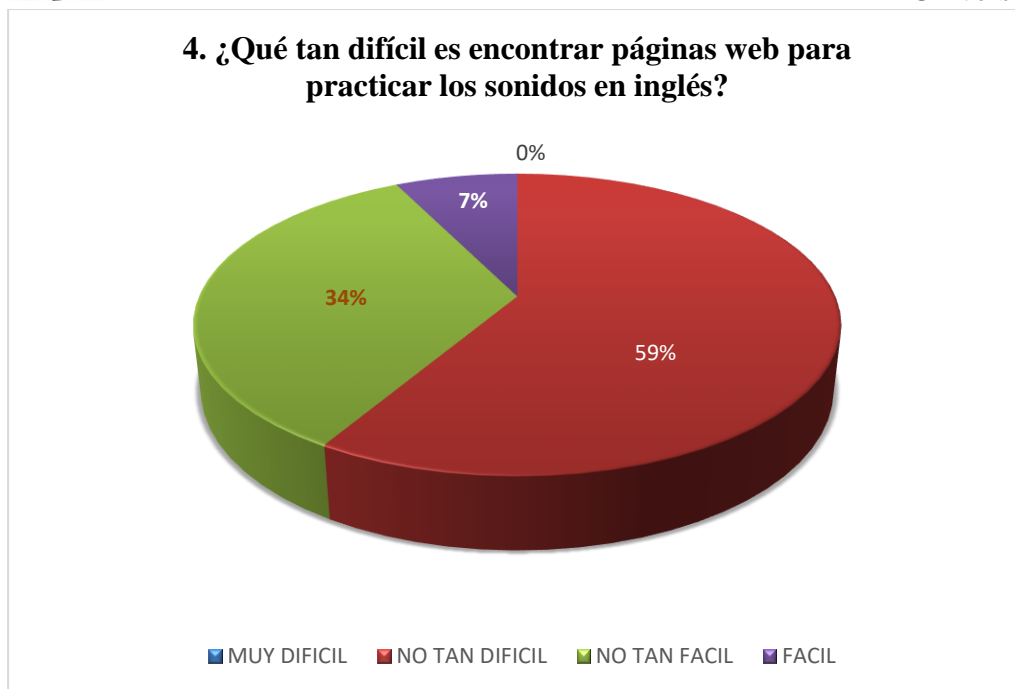


Figure 5. Difficulties while looking for web pages to practice English sounds

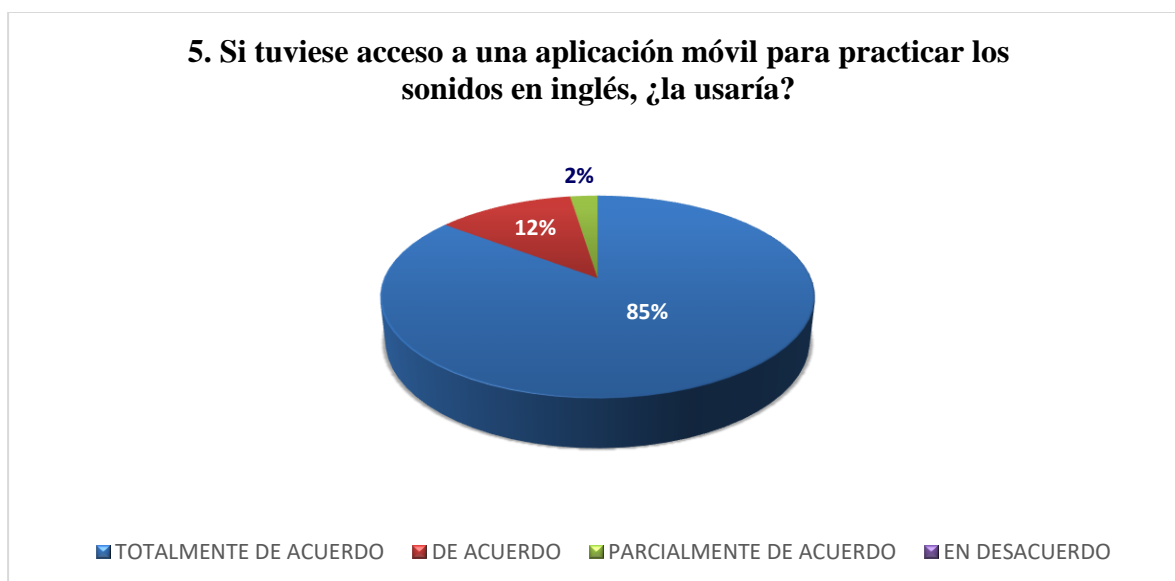


Figure 6. Acceptance of the use a mobile application as a tool for practicing English sounds

The second survey consisted of gathering students' opinions on the wireframe and storyboard of the cellphone application which was previously illustrated at the end of the



semester, since our main goal was to ensure that the app was feasible to our participants.

Results showed as follows:

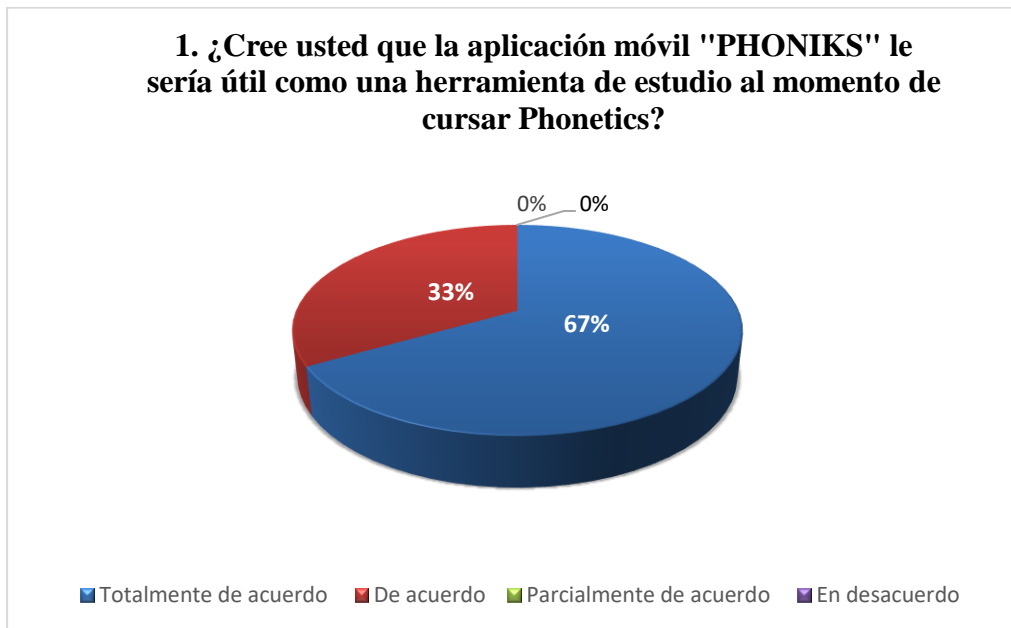


Figure 7. Acceptance of “PHONIKS” as an educational tool

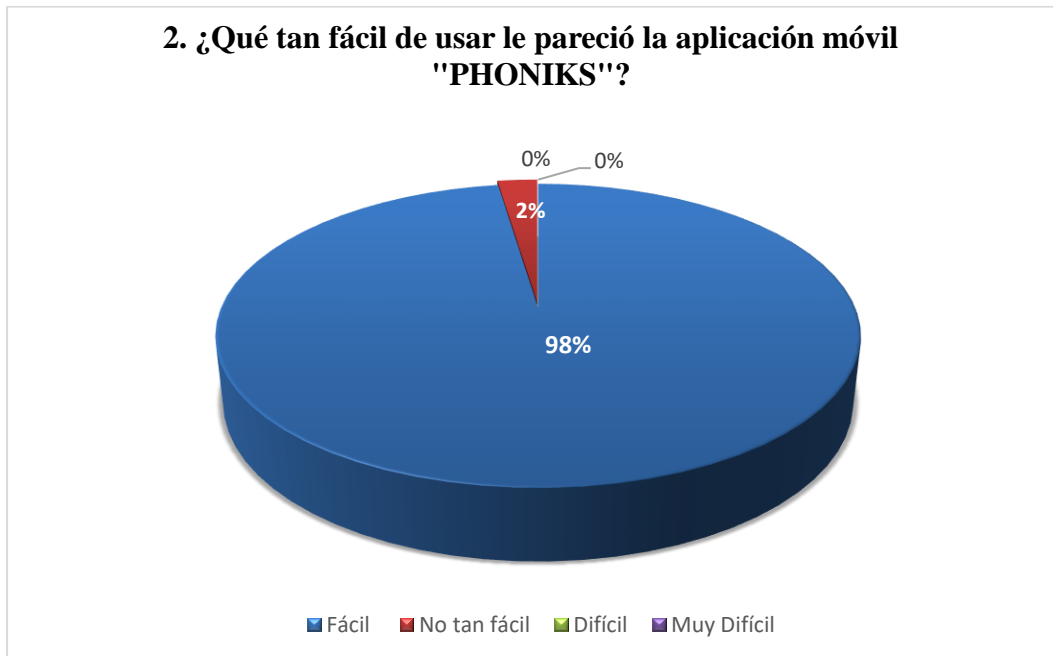
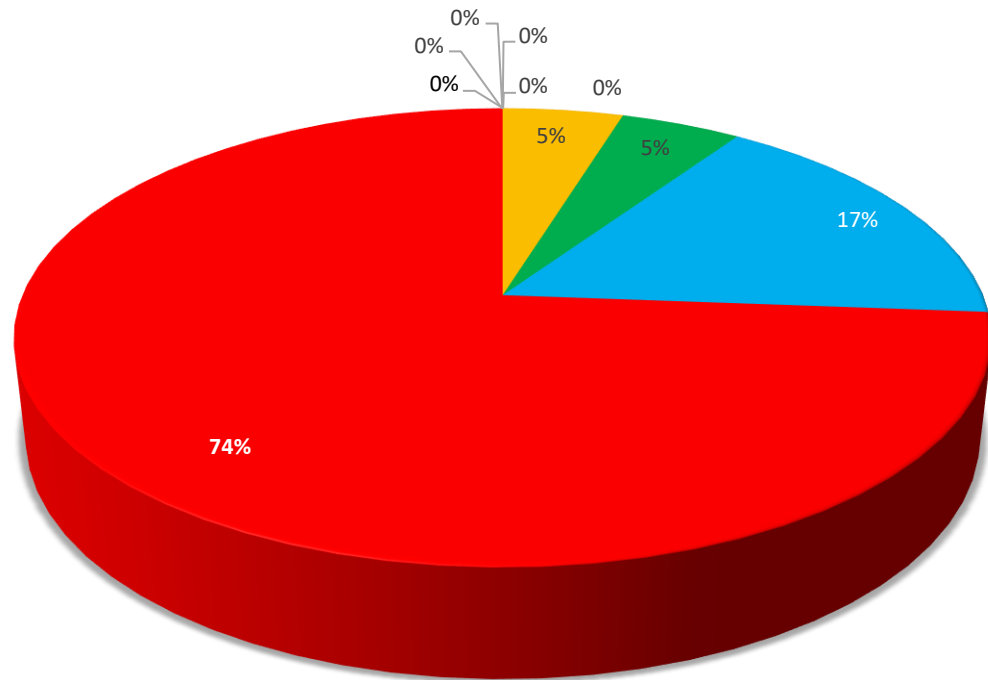


Figure 8. Level of difficulty while using “PHONIKS”

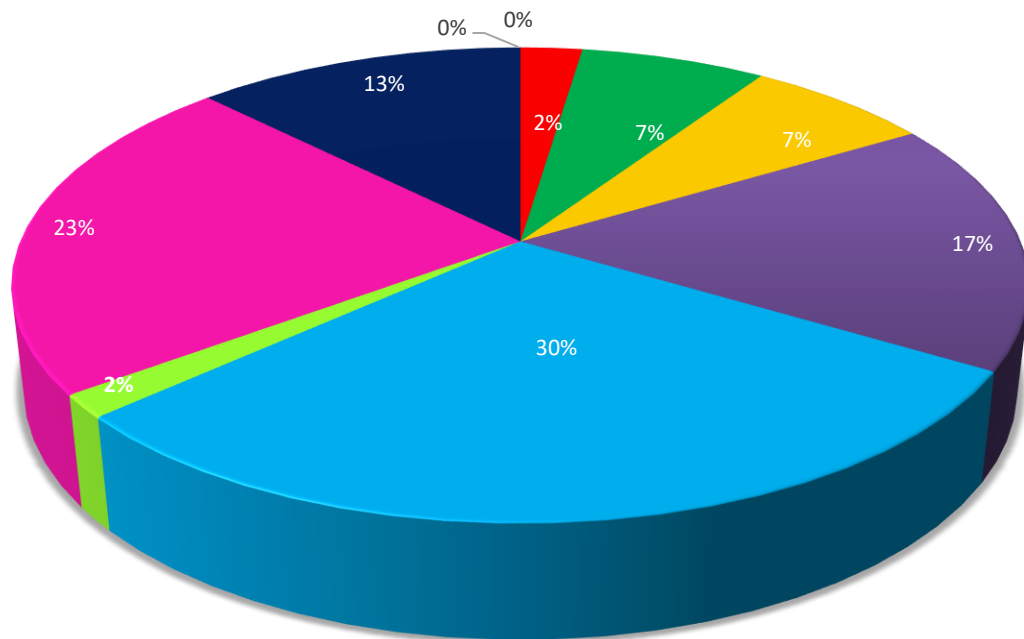


3. Considerando el menú principal, ¿qué tema le parece que NO debería estar incluido?

- What is Phonetics
- American Heritage Phonetics Symbols
- Vowels
- Common Spanish speakers errors
- About us
- Speech Organs
- Consonants
- Suprasegmentals
- Forum
- Ninguna

Figure 9. Topics that should not be included in the prototype

4. Considerando el menú principal, ¿qué temas le parecen más útiles al momento de reforzar sus dificultades en el curso de Phonetics? (máximo 3)



- What is Phonetics
- Speech Organs
- American Heritage Phonetics Symbols
- Consonants
- Vowels
- Suprasegmentals
- Common Spanish speakers errors
- Forum
- About us
- Ninguna

Figure 10. The most useful topics in the prototype



4.2.1 Discussion.

The mobile application prototype was designed to help students practice the most difficult English sounds found in this study through the use of an app that requires internet connection; therefore, it was necessary to know if students actually use the internet to practice English sounds. As shown in figure one, 100% of the 4th semester students at the English major do have a Smartphone with access to internet, which helps us demonstrate that students will be able to get hold of the application and use it to practice. The results showed that 59% of the students almost always use the internet to practice English sounds and 29% never do. This shows that overall students are not yet in the habit of using the internet to practice or improve their pronunciation skills, which is why we strongly believe that implementing a tool that is at their fingertips, in a device they use and carry with them every day, may lead to the beginning of a new habit. As Thakur (2015) stated, traditional methods and tools for pronunciation teaching are becoming outdated and replaced by the spread of computers, laptops, smartphones, and high speed internet which not only motivates students to learn, but also helps teachers monitor and track their progress effectively. Even though results show that 59% of students do not think it is too difficult to find web pages in order to practice English sounds, there is still 34% of students that believe it is not so easy, therefore, it seems feasible that students may accommodate themselves to an educational tool aimed specifically to deal with these problems.

Furthermore, the survey results from figure five show that 85% of the students coursed Phonetics are in total agreement of using a mobile application to practice English sounds. Even though, 12% of the students simply agreed and 2% partially agreed, there was no disapproval in integrating such tool in their learning process. This demonstrates that the mobile application prototype may be well received and used as an educational tool for students in the English major at the University of Cuenca. This seems reasonable since using



mobile applications for pronunciation purposes help non-English speakers hear the differences between English sounds better so that they are equipped to monitor their own speech (The Brock News, 2012).

In addition, students seem to be open to the idea of using this mobile application because mobile applications created specifically for educational purposes have contributed to make the learning process fun and easy by provoking a great level of students' engagement. Learning styles, abilities, and even learning paces have been altered over time, since students have taken up modern ways of learning through mobile applications (Roy, 2017).

According to Wallace and Lima (2018), technology and recordings help L2 learners identify differences between their pronunciation and authentic foreign pronunciation in focused speech, allowing learners to analyze their pronunciation in greater depth than when speaking in real time.

Furthermore, after a brief illustration of the cellphone application prototype and storyboard, survey results demonstrate that 67% of the participants totally agree and 33% agree that the application "PHONIKS" is a useful tool while taking Phonetics. This shows that students are willing to try new and innovative methods to enhance their pronunciation skills, and to them our proposal would be a good start. Additionally, when asked how easy it was to use the application prototype, 98% of students agreed that it was very easy. Even though 2% thought that it was not so easy to use, we believe that there could be improvements in the future to accommodate our users to their needs and skills.

In order to achieve these improvements and accommodations, we asked participants what sections or subsections of the prototype seemed unnecessary to them. The results show that 74% of the participants believe all of them are necessary; in other words, they believe



none of the sections or subsections should be deleted. Since this response was not 100%, it is worth mentioning that 17% of the students think the “About Us” section should be deleted along with “Suprasegmentals” and “Forum” which each had a 5% approval of deletion.

Lastly, the results indicated that 30% of the participants agreed that the vowel section was the most useful section of “PHONIKS” while dealing with difficulties in the Phonetics class. On the other hand, 23% agreed it was the “Spanish Speaker Errors”, and 17% agreed it was “Consonants”. These percentages match with the overall results of this investigation since it was evidenced that the sounds that cause most difficulties among students are first English vowels and then consonants; therefore, it is reasonable for students to say that these sections were the most useful for them.

4.3 Creation of the Cellphone Application

The creation of the wireframe and storyboard of the mobile application based on the results drawn out from the diagnostic test and appreciation of our participants was our final and main outcome. The application concentrates on exposing the most difficult sounds by using a word containing one of those sounds as an example. Each sound is represented in a word and it can be heard and seen in an audio and video performed by a native speaker. This video emphasizes the position of the lips, tongue and teeth, while producing the sound. Finally, the app offers a link to the American Heritage Dictionary, so students can verify the sounds in the word’s transcription. To do so, students will also have access to a chart contrasting the American Heritage Dictionary’s symbols with Dr. Ion Youman’s phonetic symbols, since those are the ones the students they are usually taught with.

The cellphone application is called “PHONIIXS” and its wireframe is adaptable for Apple and Android. Nordquist (2018) defined Phonics as a method of teaching reading based on the sounds of letters, groups of letters, and syllables. This method of teaching reading is



commonly contrasted with whole language approaches which emphasize learning whole words and their sounds in meaningful contexts. However, we took this concept and accommodated it to our needs, personalizing it as “PHONIKS”. First, we replaced the letter “c” for the “k”, since the word is pronounced as if it had a “k” in its spelling and pronunciation is what we focus on. Adding to this, we want to give the user the idea that this application is used to develop phonemic awareness. In other words, practice hearing, identifying, and reproducing certain English sounds which is exactly what Phonics concentrates on, with the only difference that Phonics enhances reading skills, while we aim to enhance pronunciation skills.

4.3.1 Wireframe and Storyboard Procedure. A graphical user interface is a type of user interface that allows users to navigate a computer or smartphone and complete actions via visual indicators and graphic icons (ITPRO, 2018). In order to develop this in our mobile application prototype, first, we had to conceptualize briefly what we wanted the prototype to expose and demonstrate, to whom it was meant to serve, and what it would be used for. Once this was clear, we grouped every tab the wireframe would have in 4 sections: “Phonetics: Characteristics”, “Common Spanish Speaker Errors”, “Forum”, and “About Us”, each one containing sub-sections (refer to table 5).



Table 6

Main Menu's Structure

Main Menu	Sub-Menus
Phonetics: Characteristics	<ul style="list-style-type: none">- What is Phonetics?- Speech Organs- American Heritage Dictionary- Consonants- Vowels (with activity)- Suprasegmentals- Vowel Chart
Common Spanish Speakers Errors	<ul style="list-style-type: none">- Sound- Example- Audio- Link- Video Animation
Forum	<ul style="list-style-type: none">- Add comments/suggestions- Delete comments/suggestions- Recordings
About Us	<ul style="list-style-type: none">- Founders- Motives



After having this structure set, we proceeded with the creation of the prototype's sketch so that the elements would be appreciated in an orderly fashion. Then we analyzed the chromatic features in order to have a bright, striking, and interesting setting. We decided to go for the combination of turquoise and white giving the application a blueish tone theme. Once, the theme color of the application's prototype was decided, we established the final scheme. This refers to the design each tab will have considering the icons selected for each topic and the order in which they would appear in the main menu and sub-menus.

The tools used to reach this graphic interface were the software "Adobe Illustrator CS6 (2012)", which aided to vectorize the icons, figures, and shapes. According to the Oxford English Living Dictionaries (2018) "vectorize" refers to representing an image using lines to construct the outlines of the objects. Since the images cannot stay within lines, we used the software "Adobe Photoshop CS6" (McCarthran, 2012) which helped to finally settle the images, so they could be appreciated as a regular cellphone tab.

Once, the graphic interface was firm, we started to add the animations to each tab which makes the prototype simulate as a cellphone application. First, we analyzed the prototype's sketch in order to determine what animation software was useful and appropriate to our needs, and after investigating, we decided to use the software "Protopie 3.8.2" (Studio XID, 2017). After adding the multimedia elements (audios and videos), simulation trials were applied to each tab in order to check proper functioning.

The audios and videos used in the "Common Spanish Speaker Errors" were recorded by Zulema Peña Alvarez, a native English speaker and one of the founders of this proposal, since it is considered suitable to expose these English sounds by a native speaker. However, the audios used in other sections, such as "Consonants", "Vowels", and "Suprasegmentals" were taken from the American Heritage Virtual Dictionary, since those are the ones usually



Universidad de Cuenca used by instructors at the University. This multimedia was edited in terms of sound clearance, timing, and video editing using the software “Adobe Premiere Pro CC” (Jago, 2015) and “Adobe Media Encoder CC” (Adobe, 2018).

While creating each tab’s animation, we positioned the text, images, videos, and audios in layers; this way, there would be a certain ranking as to when each animation would occur. We found it necessary to add navigation icons which allows users to go back a tab or return to the main menu, so we decided to use the software “Adobe XD CC” (Adobe, 2018).

At the moment of finishing the prototype and storyboard layout, we found it necessary and interesting to add a forum section to our application, where significant feedback on students’ performance could take place. While we were investigating innovative and efficient educational tools to enhance students speaking and communication skills, we found that sharing ideas, thoughts, or posting questions, or comments really helps students become aware of their faults without having teacher or peer pressure. According to London Deanery (2012) “feedback” helps students become aware of the gap between the actual and desired performance by providing a space for self-reflection and motivation to improve.

Finally, the wireframe and storyboard of the cellphone application was tested several times to avoid difficulties or faults while illustrating the proposal. Since it is a storyboard, in order to have access and reproduce it as an application simulator with all its elements, it was necessary to upload it to a virtual storage platform “Protopie Cloud”. We must mention that the “PHONIKS” wireframe and storyboard was created by Zulema Peña Alvarez and Francisco Urgilez, while assisted by professional graphic designers from the studio “Matrix Design”.



CHAPTER V: Conclusion

After analyzing the outcomes of this investigation, it could be concluded that future English teachers who are native Spanish speakers at the University of Cuenca have difficulties while producing some English vowel and consonant sounds. These sounds turn out to be problematic for the students because they are used to having only one vowel sound for each vowel in their alphabet, rather than having more than one vowel sound for each vowel like in the case of English. The fact that foreign language learners tend to use their mother tongue pronunciation when accommodating to foreign sounds was evidenced in this study. For example, while producing English vowel sounds, some participants pronounced their Spanish vowel sound equivalents.

Likewise, the participants mainly demonstrated that if two consonants sound the same in Spanish, such as the “z” and “s”, they think should sound the same in English. This occurred since students commonly transfer their internalized conceptual patterns into the foreign language they are learning. Students ignore the fact that in English each consonant sounds differently. For example, the consonants /b/ vs. /v/ and /s/ vs. /z/ were commonly pronounced exactly the same because the students are used to the fact that in Spanish there is no difference in pronunciation between the consonants /v/ - /b/ and /s/ - /z/. On the other hand, concerning consonants, it was evidenced that students usually drop the consonants /d/, /t/, and /l/ in word final position. We realized, according to the words that were pronounced without the last consonant, that students avoided the sound of the last consonant when it was part of a consonant cluster in word final position such as “nt” or “rt”. This may occur since in Spanish there are no real consonant clusters in word final position because every consonant or pair of consonants are always followed by a vowel (Aguilar, 2006).

Additionally, the surveys confirmed that students at the English major are aware that the vowel sounds are difficult sounds to pronounce while learning the English language;



therefore, they are willing to take in an innovative method such as a mobile application dedicated to practicing English vowels mainly with consonant sounds as well. Counting with a device at their fingertips that deals with unfamiliar and new sounds can make students acquire new habits of practice; therefore, improve their performance.

Proposing a cellphone application as an educational tool to deal with these specific errors is hopefully the beginning of a new approach for pronunciation teaching at the University of Cuenca. Having in mind the most difficult sounds for students at the English major is the first step to knowing what problematic areas need to be addressed. Teachers can draw upon this thesis in order to plan their classes precisely and address errors that need to be worked on. The errors that were listed after analyzing the diagnostic test show how participants actually pronounced English words that contain vowel and consonant sounds in various positions, and then, they were contrasted with how the words actually sound according to the American Heritage dictionary; that way, teachers can easily infer why each error occurred. For example, as mentioned above, it was noticeable that most students pronounced an English vowel as it is pronounced in Spanish and paid no attention to the differences between both languages. Therefore, an interesting approach in pronunciation teaching would be that teachers could begin their classes indicating the differences in pronunciation between both languages in vital and primary sounds such as vowels and consonants, before teaching the English sounds as isolated units. If teachers know what students' major difficulties are while learning English, it becomes easier to develop materials to address these problems, thereby improve students' performance.

During the illustration of the mobile application prototype, the students could evidence that the cellphone application deals specifically with what they need help in. For them, practicing through a cellphone app what was determined as the most difficult sounds for native Spanish speakers is very important and useful. Overall, the participants do not



seem to reject the idea of incorporating new educational tools as long as they feel identified with the addressed flaws.

Hopefully, our proposal will one day be extended and adapted into a mobile application available on Android and Apple in order to aid students practice and enhance their pronunciation skills during a Phonetics course. Further investigation can be done in order to propose a tool aimed to deal with errors in pronunciation among native Spanish speakers who are taking different levels of a general English language learning program. This can give our investigation a great and significant twist, since that way it could become a tool used in EFL classrooms to address these flaws from the beginning.



References

- Adobe (2018). Adobe Media Encoder CC [Computer software]. Retrieved from <https://www.adobe.com/>
- Adobe (2018). Adobe XD CC [Computer software]. Retrieved from <https://www.adobe.com/>
- Aguilar, R. (2006). Spanish Pronunciation: Consonant Clusters. Retrieved from <http://www.intro2spanish.com/pronunciation/consonant-clusters.htm>
- Al-Abdely, A., & Yap, N. (2016). Learning English Vowels by Iraqi EFL Learners: Perceived Difficulty versus Actual Performance. *3L The Southeast Asian Journal of English Language Studies*, 22(1), 1-18. doi:10.17576/3l-2016-2201-01
- Arimilli, M., Kanuri, A. K., & Kokkirigadda, W. K. (2016). Innovative Methods in Teaching Pronunciation. *International Journal of Science Technology and Management*, 5(8), 108-112. Retrieved from http://www.ijstm.com/images/short_pdf/1470367873_1049ijstm.pdf
- Avery, P., & Ehrlich, S. (Eds.). (1987). TESL Talk The teaching of Pronunciation (Vol. 17, No. 1). Toronto, Ont: Ministry of Citizenship and Culture
- Beckett, N. (2015, December 09). 15 Disadvantages of Technology in Education. Retrieved from <https://universityhomeworkhelp.com/15-disadvantages-of-technology-in-education/>
- Berg, J. (2013, October 01). Spanish vowels vs. English vowels. Retrieved from <http://spanishlinguist.us/2013/04/spanish-vowels-vs-english-vowels/>
- Bhutia, T. K. (2015, August 25). Intonation. Retrieved from <https://www.britannica.com/topic/intonation>
- Bilingua. (2018, February 08). 5 Reasons to Use the Speech Shadowing Technique. Retrieved from <https://bilingua.io/5-reasons-to-use-the-speech-shadowing-technique>



Boersma, P., & Weenink, D. (1995). Praat: Doing Phonetics by Computer. Retrieved from

<http://www.fon.hum.uva.nl/praat/>

British Council. (2006). Drill. Retrieved from <https://www.teachingenglish.org.uk/article/drill>

British Council. (2013, August). The English effect. Retrieved from

<https://www.britishcouncil.org/organisation/policy-insight-research/research/the-english-effect>

British Library. (2007, March 13). Received Pronunciation. Retrieved from

<http://www.bl.uk/learning/langlit/sounds/find-out-more/received-pronunciation/>

Busa, M. G. (2008, January). New Perspectives in Teaching Pronunciation. Retrieved from

http://www.academia.edu/27314555/New_Perspectives_in_Teaching_Pronunciation

CAN-8 Virtual Lab [Computer Software]. (1990). Toronto, ON, Canada: Sounds Virtual

Celce-Murcia, M., Brinton, D.M., Goodwin, J.M. (2010). Teaching Pronunciation: A course book and reference guide. New York, NY: Cambridge University Press

CliffsNotes. (2016). Ethical Considerations. Retrieved from

<https://www.cliffsnotes.com/study-guides/psychology/psychology/research-methods-in-psychology/ethical-considerations>

Computer Hope. (2017, October 11). What is a Forum? Retrieved from

<https://www.computerhope.com/jargon/f/forum.htm>

Conti, A. (2009). Is it really necessary to teach pronunciation? Retrieved from

http://www.matefl.org/_mgxroot/page_10766.html

Cook, A. (1991). *American Accent Training: A Guide to Speaking and Pronouncing*

American English for Anyone Who Speaks English As a Second Language (Pap/Cas ed.). New York: Barrons.

Couper, G. (2016). Teacher cognition of pronunciation teaching amongst English language teachers in Uruguay. *Journal of Second Language Pronunciation*, 2(1), 29-55.



doi:10.1075/jslp.2.1.02cou

Crystal, D., & Potter, S. (2018, April 25). English language. Retrieved from

<https://www.britannica.com/topic/English-language>

Crystal, D., & Robins, R. (2018, January 05). Language. Retrieved from

<https://www.britannica.com/topic/language>

Davies, G. (2002). CALL (computer assisted language learning). Retrieved from

<https://www.llas.ac.uk/resources/gpg/61>

Demenko, G., Wagner, A., & Cylwik, N. (2010). The Use of Speech Technology in Foreign Language Pronunciation Training. *Archives of Acoustics*, 35(3). doi:10.2478/v10168-010-0027-z

Diffen. (2018). American English vs British English. Retrieved from

https://www.diffen.com/difference/American_English_vs_British_English

Djouadselma, (2015). *The Importance of Using Audio Books in Enhancing EFL Students listening Skill (Unpublished master's thesis)*. University of Mohamed Kheider Biskra.

Retrieved from <http://dspace.univ->

biskra.dz:8080/jspui/bitstream/123456789/6017/1/Djouadselma.pdf

Dobie, R. A., & Hemel, S. V. (2005). *Hearing loss determining eligibility for Social Security benefits*. Washington, DC: National Academies Press. Retrieved from

<https://www.ncbi.nlm.nih.gov/books/NBK207834/>

Finch, D. F., & Lira, H. O. (1988). *A course in English Phonetics for Spanish Speakers*. London: Heinemann Educational Books. Retrieved from

<https://es.scribd.com/doc/51679187/A-Course-in-English-Phonetics-for-Spanish-Speakers>.

Fitting Image. (2013, November 15). The importance of audio visual technology in education. Retrieved from <http://fittingimage.ie/importance-audio-visual->



[technology-education-underestimated/](#)

Foote, J. A., Holtby, A. K., & Derwing, T. M. (2012). Survey of the Teaching of Pronunciation in Adult ESL Programs in Canada, 2010. *TESL Canada Journal*, 29(1), 1. doi:10.18806/tesl.v29i1.1086

Fundsforngos. (2012, November 28). What is the difference between outputs and outcomes? Retrieved from <https://www.fundsforngos.org/free-resources-for-ngos/defining-project-results-proposal-difference-outputs-outcomes/>

Gilakjani, A. P. (2016). The Significance of Pronunciation in English Language Teaching. *International Journal of Research in English Education*, 1(1), 1-6. doi:10.5539/elt.v5n4p96

Gilakjani, A., Ahmadi, S., & Ahmadi, M. (2011). Why is Pronunciation So Difficult to Learn? *English Language Teaching*, 4(3), 74-83. doi:10.5539/elt.v4n3p74

Gutierrez, F. (2001). The Acquisition of English Syllable Timing by Native Spanish Speakers Learners of English. An Empirical Study. *International Journal of English Studies*, 1, 93-113. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.857.373&rep=rep1&type=pdf>

Hismanoglu, M., & Hismanoglu, S. (2010). Language teachers' preferences of pronunciation teaching techniques: Traditional or modern? *Procedia - Social and Behavioral Sciences*, 2(2), 983-989. doi:10.1016/j.sbspro.2010.03.138

Hudson, J. (2013, December 03). 10 Spanish Pronunciation Errors. Retrieved from <https://pronunciationstudio.com/spanish-speakers-english-pronunciation-errors/>

Hudson, J. (2013, January 06). How to Teach Pronunciation | 5 Tips for ESL Teachers. Retrieved from <https://pronunciationstudio.com/how-to-teach-pronunciation/>

International Phonetic Alphabet. (2017). What Is The International Phonetic Alphabet?



Retrieved from <http://www.internationalphoneticalphabet.org/>

ITPRO. (2018, May 22). What is a graphical user interface? Retrieved

from <http://www.itpro.co.uk/operating-systems/30248/what-is-a-graphical-user-interface>

Jago, M. (2015). Adobe Premiere Pro CC [Computer software]. Retrieved from

<https://www.adobe.com/>

Java. (2014, July 30). What is Java and why do I need it? Retrieved from

https://www.java.com/en/download/faq/whatis_java.xml

Keddie, J. (2006). Spanish Voices in the English classroom. *IH Barcelona ELT Conference*,

1-15. Retrieved from <https://www.ihes.com/bcn/tt/eltconf/keddie.pdf>

Kennedy, S., & Trofimovich, P. (2010). Language awareness and second language

pronunciation: A classroom study. *Language Awareness*, 19(3), 171-185.

doi:10.1080/09658416.2010.486439

Kondo, M., Ishikawa, Y., Smith, C., Sakamoto, K., Shimomura, H., & Wada, N. (2012).

Mobile Assisted Language Learning in university EFL courses in Japan: Developing attitudes and skills for self-regulated learning. *ReCALL*, 24(02), 169-187.

doi:10.1017/s0958344012000055

Labaree, R. V. (2018). Research Guides: Organizing Your Social Sciences Research

Paper: Quantitative Methods [Research Guide]. Retrieved from

<http://libguides.usc.edu/writingguide/quantitative>

Ladefoged, P. N. (2014, August 21). Phonetics. Retrieved from

<https://www.britannica.com/science/phonetics#ref583946>

Lanir, L. (2011, December 07). What is Phonology? Phonemic Awareness vs. Phonological

Perception. Retrieved from <https://www.decodedscience.org/what-is-phonology->



[phonemic-awareness-explained/7242](#)

Lieuw, T. (2014, September 24). Getting Started with Online Discussion Forums. Retrieved from <https://teachingcommons.stanford.edu/teaching-talk/getting-started-online-discussion-forums>

London Deanery. (2012). Why is Feedback important. Retrieved from <https://faculty.londondeanery.ac.uk/e-learning/effective-feedback/why-is-feedback-important>

McCathran, K. (2012). Adobe Photoshop CS6 [Computer software]. Retrieved from <https://www.adobe.com/>

McMahon, A. M. (2002). *An introduction to English Phonology*. Edinburgh: Edinburgh Univ. Press. Retrieved from <http://staffnew.uny.ac.id/upload/132107096/pendidikan/Book one.pdf>

Mora, J.C., & Fullana, N. 2007. Production and perception of /i:/ - /ɪ/ and /æ/ - /ʌ/ in a formal setting: Investigating the effects of experience and starting age. In *Proceedings of the 16th International Congress of Phonetic Sciences*, 1613–1616, Saarbrücken, Germany.

Morehouse, K. (2017, August 19). What Are the Four Language Skills? LinguaCore. Retrieved from <https://www.linguacore.com/blog/the-four-skills/>

Music Production Glossary. (2018, April 19). A-B-X Test. Retrieved from <https://www.musicproductionglossary.com/a-b-x-test/>

Nordquist, R. (2018, January). 4 Phonics-Based Methods of Teaching Children to Read. Retrieved from <https://www.thoughtco.com/phonics-definition-1691506>

Ogden, R. (2009). *An introduction to English phonetics*. Edinburgh: Edinburgh University Press. Retrieved from <https://www.questia.com/library/120075566/an-introduction-to->



[english-phonetics](#)

Oxford English Living Dictionaries. (2018). Vectorize [Def. 2]. In Oxford English Living Dictionaries. Retrieved from <https://en.oxforddictionaries.com/definition/vectorize>

Oxford University Press ELT. (2015, April 08). 'Value for money': Helping your students get more from words and phrases they learn [English Language Teaching Global Blog]. Retrieved from <https://oupeltglobalblog.com/2015/04/07/helping-your-students-get-more-value-for-money-from-the-words-and-phrases-they-learn/>

Oxford University Press ELT. (2016, April 11). #IATEFL - Improving pronunciation: Helping students get 'more value' from their English [English Language Teaching Global Blog]. Retrieved from <https://oupeltglobalblog.com/2016/04/06/improving-pronunciation-helping-students-get-more-value-from-their-english/>

Oz, H. (2014). Prospective English Teachers' Ownership and Usage of Mobile Devices as M-learning Tools. *Procedia - Social and Behavioral Sciences*, 141, 1031-1041.
doi:10.1016/j.sbspro.2014.05.173

Pickett, J. (Ed.). (2012). *The American Heritage dictionary* (5th ed.). New York, NY: Delta.

ProffesorToday. (2018, March 05). Exploratory Research Design - Concept - Objectives. Retrieved from <https://proffesortoday.com/exploratory-research-design/>

Quoc, H. (2016, September 6). The essential secrets to speak English naturally and fluently. Retrieved from <https://ieltsmaterial.com/the-secret-to-speak-english-naturally-and-fluently/>

Rachel's English. (2014). Welcome to your New American English Accent. Retrieved from <http://rachelsenglish.com/about/>

Rippel, M. (2018, March 21). How to Teach Schwas. Retrieved from



<https://blog.allaboutlearningpress.com/schwas/>

Rouse, M. (2016). What is data collection? - Definition from WhatIs.com. Retrieved

from <https://searchcio.techtarget.com/definition/data-collection>

Roy, S. (2017, August 02). 5 Benefits of Using Mobile Apps in Education. Retrieved from

<https://elearningindustry.com/mobile-apps-in-education-5-benefits>

Saito, K. (2007). The influence of explicit phonetic instruction on pronunciation teaching in

EFL settings: The case of English vowels and Japanese learners of English. *Linguistic Journal*, 3 (3), 17-41.

Saran, M., Seferoglu, G., & Cagiltay, K. (2009). Mobile Assisted Language Learning:

English Pronunciation at Learners' Fingertips. *Egitim Arastirmalari-Eurasian Journal of Educational Research*, 34, 97-114.

Saundz. (2014, July 29). The Importance of Proper Pronunciation | Saundz | American

English Pronunciation Software. Retrieved from <http://saundz.com/the-importance-of-proper-pronunciation/>

Seeley, J. (2012). Adobe Illustrator CS6: Essential training [Computer software]. Retrieved

from <https://www.adobe.com/>

Shtern, A. (2017, April 24). The Importance of Good Pronunciation. Retrieved from

<http://shaneschools.com/en/the-importance-of-good-pronunciation/>

Shute, V. J. (2007). Focus On Formative Feedback. *ETS Research Report Series*,

2007(1), p.1. I-47. doi:10.1002/j.2333-8504.2007.tb02053.x

Speak, H. (2015, July 16). The importance of correct pronunciation. Retrieved from

<https://www.hopespeak.com/blog/the-importance-of-correct-pronunciation/>

Studio XID (2017). Protopie 3.8.2 [Computer software]. Retrieved from

<https://www.protopie.io/>



Tache, O. (2014, November 17). Choosing between a British and American accent. Retrieved

from <https://blog.esl-languages.com/blog/learn-languages/american-british-accent-language-learning/>

Tanner, M.W., & Landon, M.L. (2009). The effects of computer-assisted pronunciation readings on ESL learners' use of pausing, stress, intonation, and overall comprehensibility. *Language Learning & Technology*, 13, 51-65.

Teacher Finder. (2017, August 10). Linguistic Difficulties Spanish Speakers Face When Learning English. Retrieved from

<https://www.weareteacherfinder.com/blog/linguistic-difficulties-english-spanish-speakers/>

Thakur, P. (2015). Teaching Listening and Pronunciation: A Technology Inspired Approach.

Retrieved from

http://www.academia.edu/26126294/Teaching_Listening_and_Pronunciation_A_Technology_Inspired_Approach

The Brock News. (2012, February 14). App and website help non-English speakers learn

pronunciation. Retrieved from <https://brocku.ca/brock-news/2012/02/app-and-website-help-non-english-speakers-learn-the-accent/>

The Education Endowment Foundation. (2018, June). Feedback. Retrieved from

<https://educationendowmentfoundation.org.uk/pdf/generate/?u=https://educationendowmentfoundation.org.uk/pdf/toolkit/?id=131&t=Teaching%20and%20Learning%20Toolkit&e=131&s>

The Sound of English. (2018, May 25). /v/ vs /b/. Retrieved from

<http://thesoundofenglish.org/v-vs-b/>

Theodorou, E., Kambanaros, M., & Grohmann, K. (2017, November 17). Sentence

Repetition as a Tool for Screening Morphosyntactic Abilities of Bilingual Children



with SLI. Retrieved from

<https://www.frontiersin.org/articles/10.3389/fpsyg.2017.02104/full>

Thering, R. (2017, July 27). 8 Creative and Engaging ESL Listening Activities for Adults. Retrieved February from <https://www.fluentu.com/blog/educator-english/esl-listening-activities-for-adults/>

University of Manitoba. (2005). Aspiration. Retrieved from <https://home.cc.umanitoba.ca/~krussll/phonetics/narrower/aspiration.html>

University of Oulu. (2012, March). Why Study Phonetics? Retrieved from <http://www.oulu.fi/phonetics/node/5752>

University of Sheffield. (2016, May 23). Learning and Teaching Services. Retrieved from <https://www.sheffield.ac.uk/lets/toolkit/f-a/technology>

Wallace, L. R., & Lima, E. F. (2018). Technology for Teaching Pronunciation. *The TESOL Encyclopedia of English Language Teaching*, 1-7.
doi:10.1002/9781118784235.eelt0443

Wu, Q. (2014). Learning ESL Vocabulary with Smartphones. *Procedia - Social and Behavioral Sciences*, 143, 302-307. doi:10.1016/j.sbspro.2014.07.409

Xu, F. (2009). Short-Term Memory in EFL Listening Comprehension. *Asian Social Science*, 4(4), 103. Retrieved from <http://www.ccsenet.org/journal/index.php/ass/article/view/1609>

Yoshida, M. T. (2016). *Beyond repeat after me: Teaching pronunciation to English learners*. Alexandria, VA: Tesol Press. Retrieved from http://www.tesol.org/docs/default-source/books/14038_sam.pdf?sfvrsn=2

Youman, I. (2014a). *English Phonetics*. Cuenca: Talleres gráficos de la Universidad de Cuenca.

Youman, I. (2014b). *English Phonology*. Cuenca: Talleres gráficos de la Universidad de



Cuenca.

Universidad de Cuenca



Appendix A: Declaración de consentimiento

Yo,, estudiante de la carrera de Ciencias de la Educación en Lengua y Literatura Inglesa de la Universidad de Cuenca, he leído el documento de consentimiento informado que me ha sido entregado, he comprendido las explicaciones en él facilitadas acerca de la grabación audiovisual “Phonetics Class: Oral Diagnostic Test” y he podido resolver todas las dudas y preguntas que he planteado al respecto. También comprendo que, en cualquier momento y sin necesidad de dar ninguna explicación, puedo revocar el consentimiento que ahora presento. También he sido informado/a de que mis datos personales serán protegidos y serán utilizados únicamente con fines de formación y desarrollo investigativo para los desarrolladores de dicho proyecto. Tomando todo ello en consideración y en tales condiciones, **CONSIENTO** participar en la grabación de las sesiones y que los datos que se deriven de mi participación sean utilizados para cubrir los objetivos especificados en el documento.

En Cuenca, a de marzo de 2018

Firmado:

(El/la entrevistado/a)

**Appendix B: Preliminary Diagnostic Test**

1. all	2. long	3. caught
4. cat	5. matter	6. laugh
7. take	8. say	9. fail
10. get	11. egg	12. any
13. ice	14. I'll	15. Sky
16. it	17. milk	18. sin
19. eat	20. me	21. seen
22. work	23. girl	24. bird
25. come	26. front	27. photograph
28. smooth	29. too	30. shoe
31. took	32. full	33. would
34. told	35. so	36. roll
37. out	38. house	39. round
40. boy	41. oil	42. toy

Group A

43. banana	44. recent	45. rapid
46. committee	47. front	48. because
49. feel	50. battle	51. cotton
52. random	53. important	54. sentence
55. written	56. bread and butter	

Group B

57. work	58. car	59. door
60. cheer	61. air	62. player
63. wire	64. pure	65. poor

Group C

**Group D**

66. pit	67. bit
68. fear	69. veer
70. sue	71. zoo
72. sheer	73. din
74. tin	75. gin
76. chin	77. then
78. thin	79. gut
80. cut	81. race
82. yellow	83. breed
84. would	85. man
86. him	87. name
88. lace	89. bleed

90. cap	91. cab
92. half	93. have
94. race	95. raise
96. rush	97. rouge
98. hat	99. had
100. rich	101. ridge
102. bath	103. bathe
104. tack	105. tag
106. say	107. sore
108. how	109. pepper
110. soul	111. palm
112. people	113. can
114. sing	

115. staple	116. stable
117. refers	118. reverse
119. faces	120. phases
121. cashew	122. casual
123. metal	124. medal
125. catcher	126. cadger
127. ether	128. either
129. bicker	130. bigger
131. million	132. correction
133. coward	134. surprise
135. reheat	136. summer
137. collection	138. runner
139. supplies	140. kingdom



Group E

141.	body	142.	bought
143.	bad	144.	bat
145.	bade	146.	bait
147.	bed	148.	bet
149.	bid	150.	bit
151.	bead	152.	beat
153.	bird	154.	burt
155.	bud	156.	but
157.	booed	158.	boot
159.	should	160.	soot
161.	bode	162.	boat
163.	bowed	164.	bout
165.	boyd	166.	boyt



Appendix C: Survey - Encuesta #1

Participantes: alumnos del cuarto ciclo de la carrera “Ciencias de la Educación en Lengua y Literatura Inglesa”.

Ésta encuesta se lleva a cabo como parte del proyecto de graduación “An Aid to Study Phonetics: Wireframe and Storyboard of a cell phone application as an educational tool for students of the English Literature major at the University of Cuenca”. Su propósito consiste en conocer el uso y percepciones de aplicaciones móviles como medio de aprendizaje de los sonidos del inglés. La información será utilizada sólo con fines estadísticos.

Por favor marque con una X su respuesta a las siguientes preguntas.

1. ¿Posee usted un Smartphone (teléfono inteligente)?

Si No

2. ¿Cuenta con internet en su teléfono celular cuando está en la universidad (ya sea por datos móviles o wifi)?

Si No

3. ¿Con que frecuencia ingresa al internet para practicar los sonidos del idioma inglés?

Siempre
Casi Siempre
A veces
Nunca

4. ¿Qué tan difícil es encontrar páginas web para practicar los sonidos en inglés?

Muy Difícil
Difícil
No tan difícil
Fácil

5. Si tuviese acceso a una aplicación móvil para practicar los sonidos en inglés, ¿la usaría?

Totalmente de acuerdo
De acuerdo
Parcialmente de acuerdo
En desacuerdo



Appendix D: Survey - Encuesta #2

Participantes: alumnos del cuarto ciclo de la carrera “Ciencias de la Educación en Lengua y Literatura Inglesa”.

Ésta encuesta se lleva a cabo como parte del proyecto de graduación “An Aid to Study Phonetics: Wireframe and Storyboard of a cell phone application as an educational tool for students of the English Literature major at the University of Cuenca”. Su propósito consiste en conocer su opinión sobre el prototipo de la aplicación móvil, que fue expuesta. La información será utilizada sólo con fines estadísticos.

Por favor marque con una X su respuesta a las siguientes preguntas.

1. **¿Cree usted que la aplicación móvil “PHONIKS” le sería útil como una herramienta de estudio al momento de cursar Phonetics?**

Totalmente de acuerdo

De acuerdo

Parcialmente de acuerdo

En desacuerdo

2. **¿Qué tan fácil de usar le pareció la aplicación móvil “PHONIKS”?**

Fácil.....

No tan Fácil

Difícil

Muy Difícil

3. **Considerando el menú principal, ¿qué tema le parece que NO debería estar incluido?**

What is phonetics

Consonants

Common Spanish

Speakers errors

Speech Organs ...

Vowels

Forum

Ninguna

American Heritage Phonetic Symbols ...

Suprasegmentals

About us

4. **Considerando el menú principal, ¿qué temas le parecen los más útiles al momento de reforzar sus dificultades en el curso de Phonetics? (máximo 3)**

What is phonetics

Consonants

Common Spanish

Speakers errors

Speech Organs ...

Vowels

Forum

American Heritage Phonetic Symbols

Suprasegmentals



Appendix E: Mobile Application Prototype



Figure 11. App icon

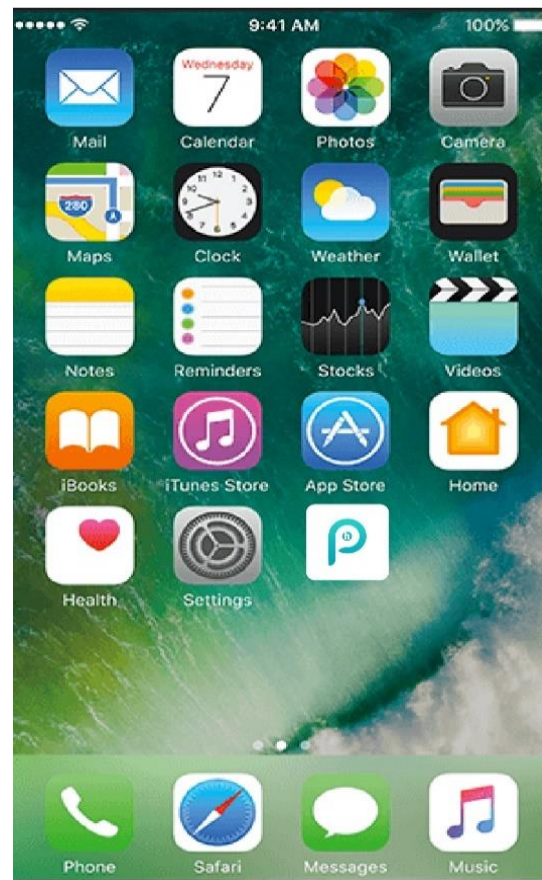


Figure 12. iPhone's Main Menu

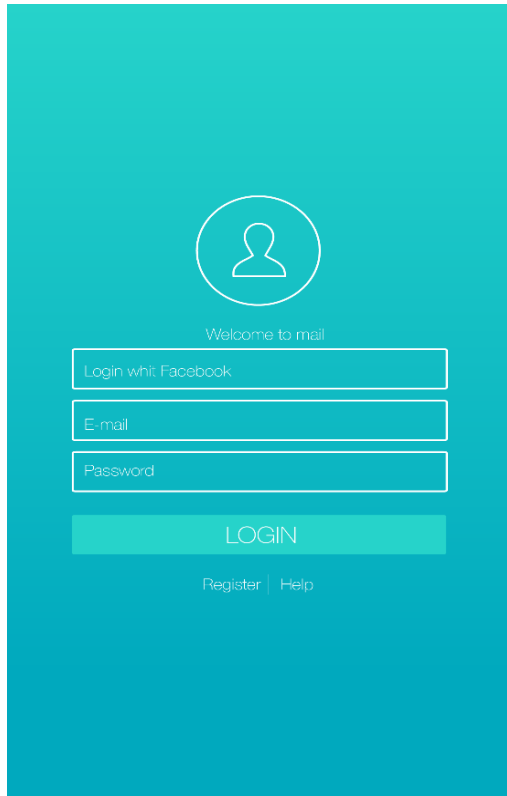


Figure 13. Log in tab

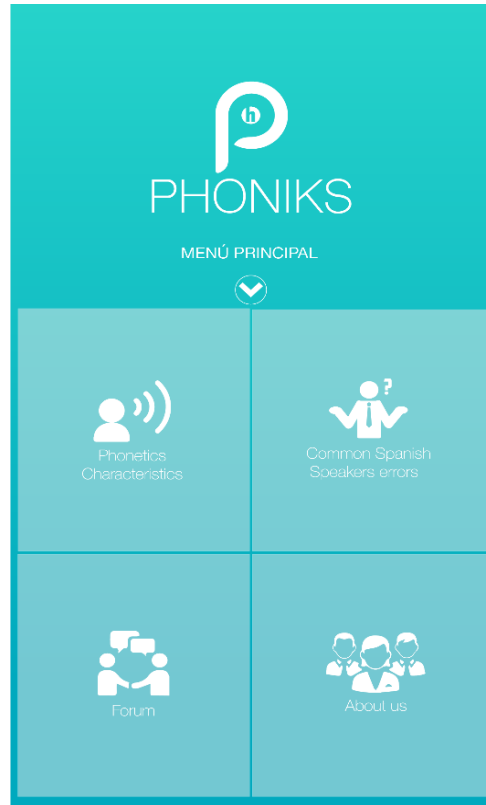


Figure 14. Phoniks' Main Menu

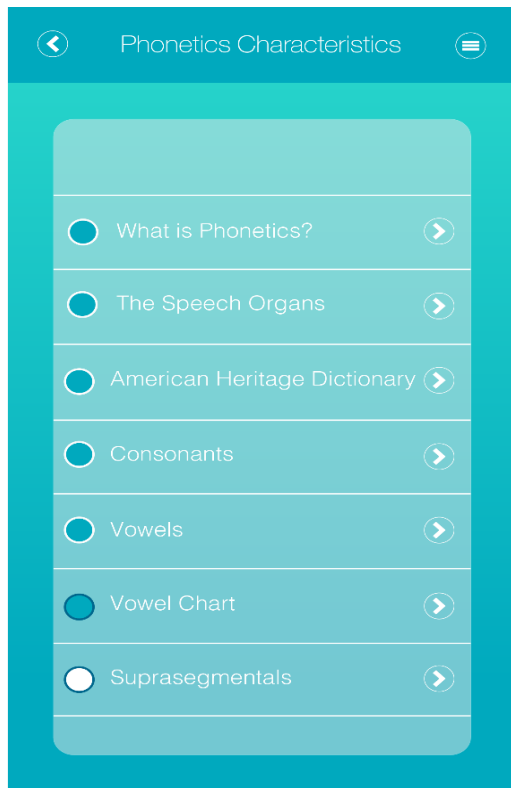


Figure 15. Main Menu: Phonetics Characteristics

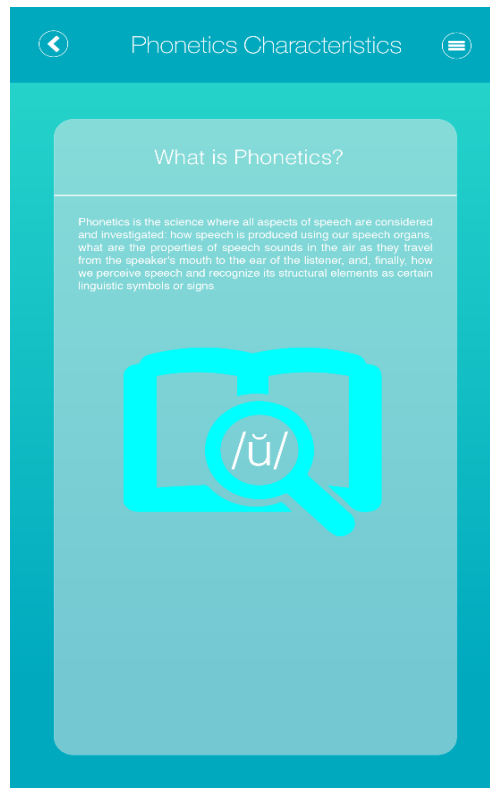


Figure 15.1. Sub Menu: What is Phonetics?

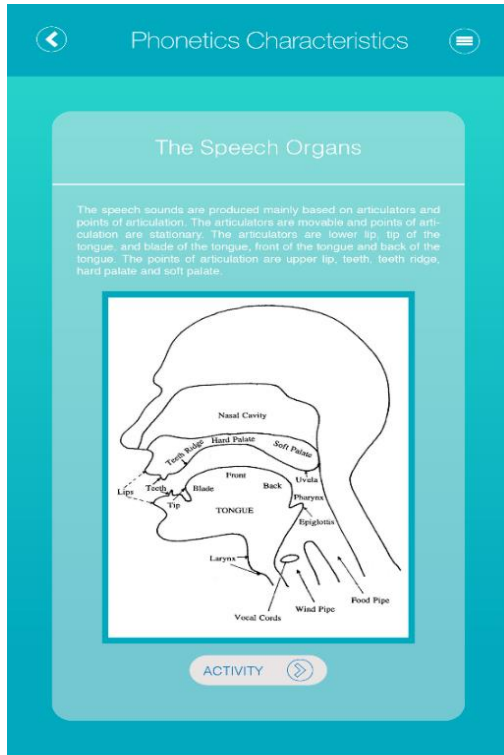


Figure 15.2. Sub Menu: Speech Organs



Figure 15.2.1. Speech Organs Activity



Figure 15.2.2. Speech Organs activity interaction



Figure 15.3. Sub Menu: American Heritage Dictionary

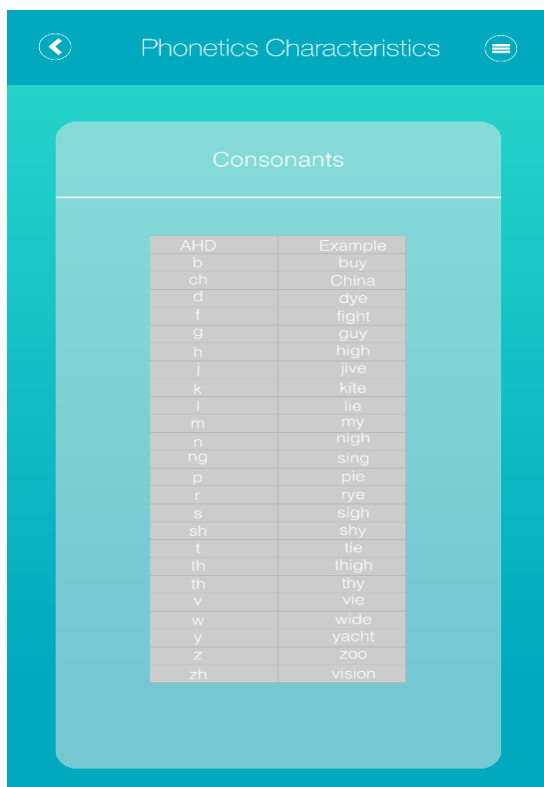


Figure 15.4. Sub Menu: Consonants

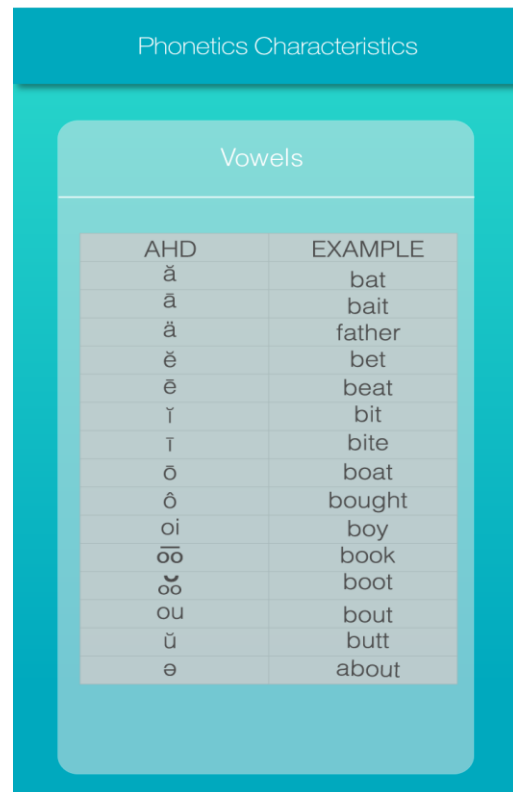


Figure 15.5. Sub Menu: Vowels

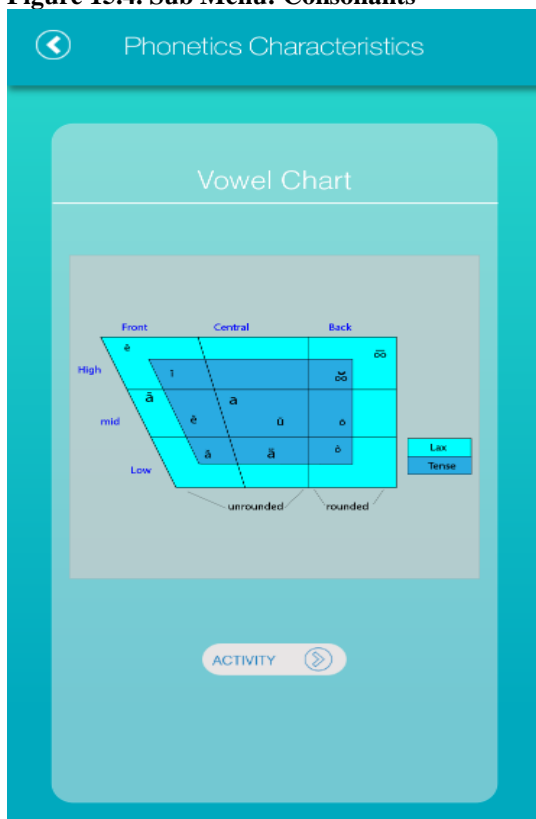


Figure 15.6. Sub Menu: Vowel Chart

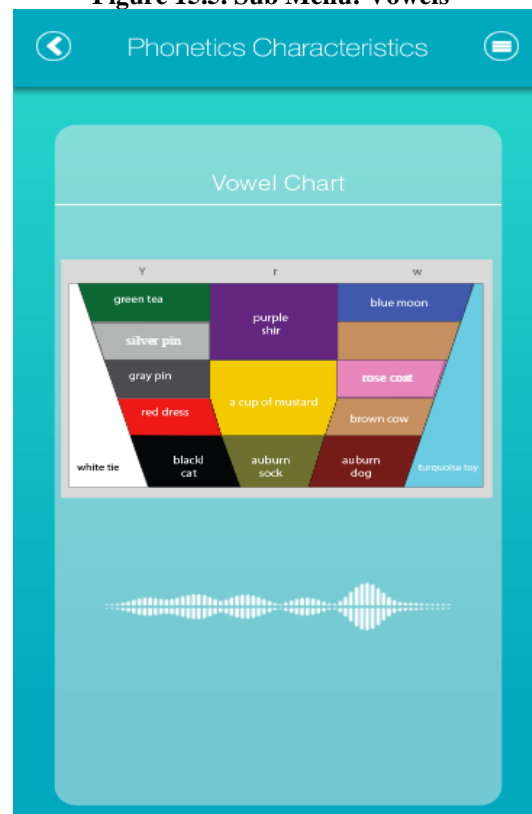


Figure 15.6.1. Vowels Activity

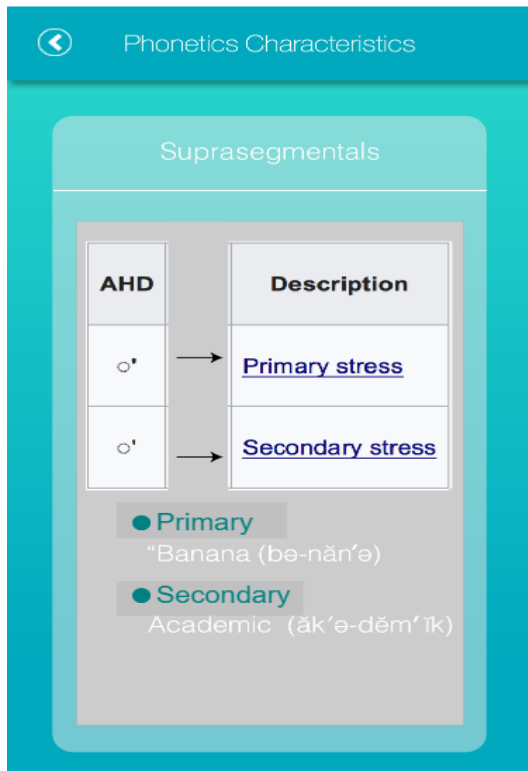


Figure 15.7. Sub Menu: Suprasegmentals

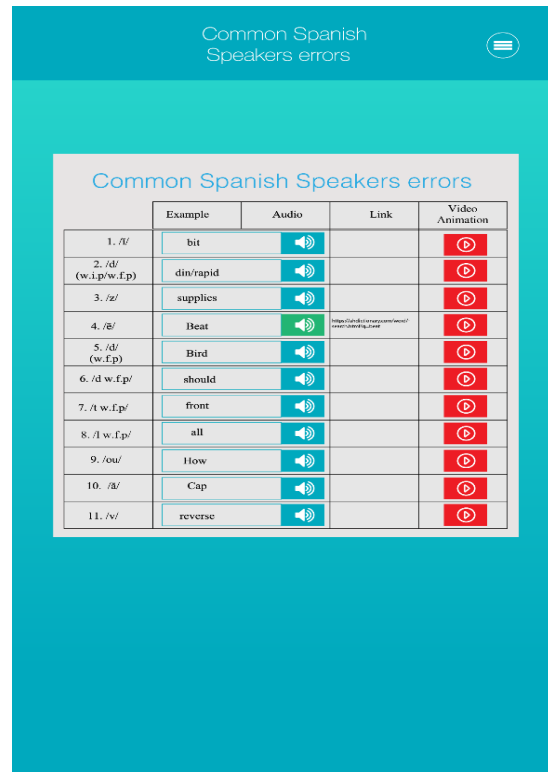


Figure 16. Main Menu: Common Spanish Speakers Errors

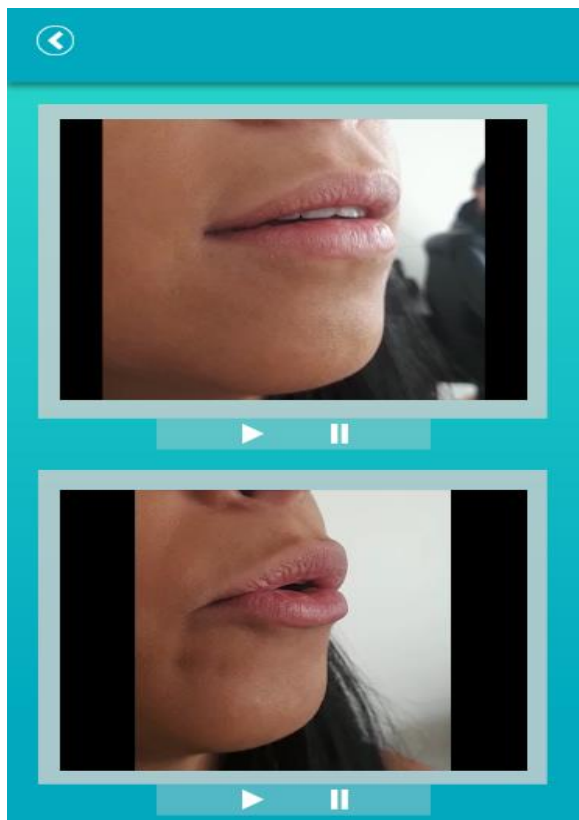


Figure 16.1. Sub Menu: Video - lips/tongue/teeth movement

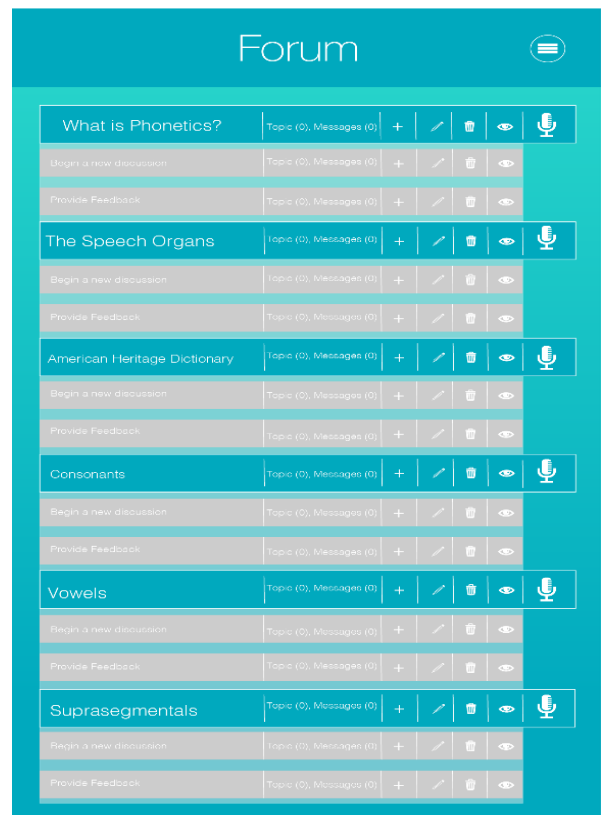


Figure 17. Main Menu: Forum

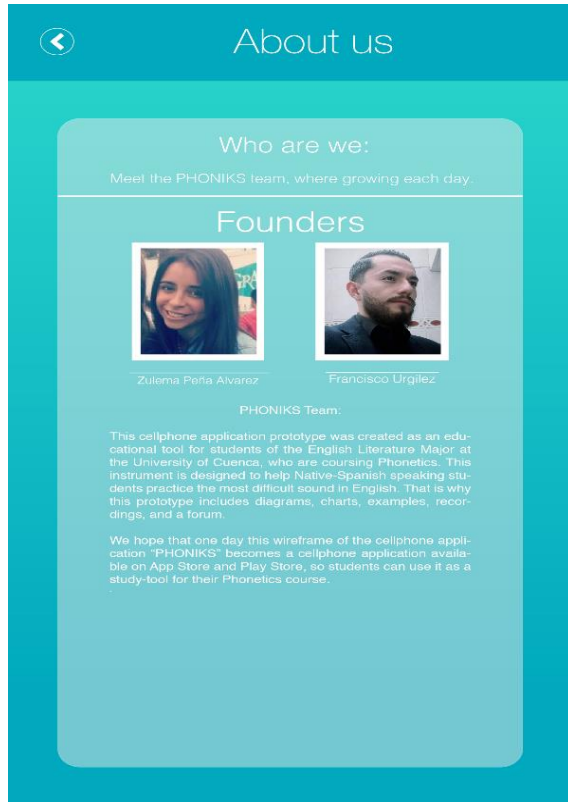


Figure 18. Main Menu: About us