

**Gamification in e-learning: game factors to strengthen specific English pronunciation
features in undergraduate students at UPTC Sogamoso**

By

Leidy Viviana Pérez Cárdenas.

Universidad Nacional Abierta y a Distancia - UNAD

Escuela de Ciencias de la Educación - ECEDU

Maestría en Mediación Pedagógica en el Aprendizaje del Inglés

CEAD-Sogamoso

2022

**Gamification in e-learning: Game factors to strengthen specific English pronunciation
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Leidy Viviana Pérez Cárdenas

A research project submitted to Escuela de Ciencias de la Educación - ECEDU

in partial fulfillment of the requirements for the degree of

Magister en Mediación Pedagógica en el Aprendizaje del Inglés

Thesis advisor:

MA. Edith Lorena Grande Triviño

Universidad Nacional Abierta y a Distancia - UNAD

Escuela de Ciencias de la Educación - ECEDU

Maestría en Mediación Pedagógica en el Aprendizaje del Inglés

CEAD-Sogamoso

2022

Approval Page

MA Edith Lorena Grande Triviño

Thesis Advisor

Jury

Jury

Sogamoso-2022

To my amazing son, Matthew, wise beyond his years

and

To my beloved husband, Diego, infinitely supportive

Acknowledgments

Mainly to God, who has given me the strength to move forward. To my parents for their advice on personal, professional, and spiritual improvement. To my husband, who with patience and support in every way accompanied me in this important process, to my son, who is undoubtedly the greatest motivation, for whom this research seeks that our hearts are always close at every stage of their lives.

To all my UNAD professors who guided, accompanied, and encouraged me from the beginning to the end. I dedicate this thesis to all of them for their patience and unconditional support.

Specialized analytical summary (RAE)

1. General information	
Type of document	Thesis
Acceso al documento	A research report submitted to Escuela de Ciencias de la Educación ECEDU in partial fulfillment of the requirements for the degree of Magister en Mediación Pedagógica en el Aprendizaje del Inglés
Title	Gamification in e-learning: game factors to strengthen specific English pronunciation features in undergraduate students at UPTC Sogamoso
Author	Leidy Viviana Pérez Cárdenas
Publication	2022
Keywords	Gamification, mediation, e-learning, pronunciation, segmental, suprasegmental, EFL
Description	<p>This research focuses on challenging an existing problem by most students in an English as a Foreign Language (EFL) context, specifically in Colombia. This problem has to deal with a lack of knowledge on English pronunciation in Colombian higher education; hence, the need to integrate pronunciation instruction by implementing in-depth strategies that engage students, attract their attention and motivate them to overcome fossilized pronunciation errors.</p> <p>Gamification is a relatively new term that often denotes the use of game components in situations unrelated to the game itself to create enjoyable, fun, and motivating learning experiences for students (Werbach and Hunter, 2012). Analyzing the games' basic factors becomes essential when defining and using gamification as a strategy for English as Foreign Language mediation to strengthen specific pronunciation features in UPTC Sogamoso undergraduate students. Based on these reflections, from the interactive learning of a language, it is necessary to look for mechanisms or strategies that overcome pronunciation problems that most young adult students fossilize during the target language acquisition process. In this sense, this study arises as an alternative for joining the technological development, framed in gamification to create a synchronous and asynchronous learning experience</p>

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The study procedure is founded on action research by implementing the gamification strategy for English pronunciation mediation, oriented to thirty students from different engineering, management, and technology programs at heterogeneous English proficiency levels. The activities mainly focused on sound production, rhythm, stress, and intonation with segmental and suprasegmental pronunciation features.

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Contents

The document compiles and provides the following structure: cover page, RAE (analytical summary of the document), abstract, table of contents, list of tables, list of appendices, introduction, statement of the problem, justification, objectives, literature review (state of the art, theoretical and conceptual framework), methodological design, analysis and interpretation of the information, results, conclusions, and recommendations, references and appendices.

Methodology

The population belongs to Universidad Pedagógica y Tecnológica de Colombia (UPTC). A Colombian public university with seven headquarters situated mainly throughout Boyacá. The population is mainly undergraduate students between sixteen and thirty years old, enrolled in engineering, technology and business programs. They have to complete six EFL course levels proposed as a degree requirement in their programs at the Universidad Pedagógica y Tecnológica de Colombia, Sogamoso headquarter. A simple random sampling method to select the participants under study is considered. A sample of about thirty students is picked from a group of students who attend the course call launched to the students of UPTC in

Sogamoso's headquarter.

This research involves undertaking an action research study by introducing more deeply pronunciation learning through game elements that enhance apprentices' segmental and suprasegmental aspects suggested by Morley (1991). Initial interpretations are tested after implementing the Perception of the Spoken English (POSE) test, and the procedure stages are the way to track what is needed to be improved or changed. In this research, different points of view are considered to reach the analysis categories and a conclusion.

Quantitative and qualitative methods are involved; since a review of undergraduate students' situation was made to identify their English pronunciation level (study variable) and integrate gamification as a pedagogical strategy (study variable) conducive to improving English pronunciation features.

The instruments used to collect the information are qualitative and quantitative.

Qualitative instruments.

- Diagnostic test, used in the diagnostic phase to determine how students use communication channels, especially social networks.

-The opinion survey was used in the reflection phase to interpret the subjects' opinions and experiences participating in the study.

- The post-test was used to make decisions when finishing the study, come to conclusions, and take the data needed to observe how the interventions are after the analysis obtained in the pre-test phase.

Qualitative instruments

- Field Diaries: In this study, field diaries' purpose was to keep systematic records of the events of the research process, based on the appreciations, opinions, and reflections of the subjects under study.

Results

This paper provides the significance of the results obtained, the pedagogical and research implications, the limitations of the present study, and the recommendations for further studies. It also answers the research question: How do gaming factors in English as Foreign Language mediation strengthen specific pronunciation features in UPTC Sogamoso undergraduate students?

The answer to the previous question was deductively directed, taking into account eight subcategories, four for the game factors category

Conclusions	<p>and four for the factors of the game related to Participants' English pronunciation. The general categories and subcategories emerged from the theory taken into account in this study and were subsequently outlined and described when analyzing the data obtained through ATLAS ti 9 in the implementation observations. On the other hand, a relation of the subcategories raised in the results of the questionnaire implemented to the students at the end of the implementation is presented, and highly positive results in the statistical analysis of the pre-test and post-test through T-student Wilcoxon semiparametric test with R software.</p> <p>The results showed an evident improvement in the segmental and suprasegmental features of the participants' pronunciation perception as well as the contribution of game goals to phonetics and phonological instruction, the game sensation to the motivation for pronunciation improvement, the game challenge to the participants' positive attitude, and the sociality to the English pronunciation exposure practice.</p>
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By	Leidy Viviana Pérez Cárdenas
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Date	17	02	2022
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Abstract

Gamification is a relatively new term that often denotes the use of game components in situations unrelated to the game itself to create enjoyable, fun, and motivating learning experiences for students (Werbach and Hunter, 2012). Therefore, analyzing the games' basic factors becomes essential when defining and using gamification as a strategy for English as Foreign Language mediation to strengthen specific pronunciation features in UPTC Sogamoso undergraduate students.

The study procedure is based on action research by implementing the gamification strategy for mediation in English pronunciation, oriented to thirty students from different engineering, management, and technology programs at heterogeneous levels of English proficiency. The activities mainly focus on sound production, rhythm, stress, and intonation, segmental and suprasegmental pronunciation features.

The results showed an evident improvement in the segmental and suprasegmental features of the participants' pronunciation perception as well as the contribution of game goals to phonetics and phonological instruction, the game sensation to the motivation for pronunciation improvement, the game challenge to the participants' positive attitude, and the sociality to the English pronunciation exposure practice.

Keywords. Gamification, pronunciation, segmental, suprasegmental, EFL

Table of Contents

List of Tables	18
List of Figures.....	19
Introduction to the Research Study	20
Context of the research problem	22
Research questions, objectives and hypothesis	27
Research question	27
Objectives	27
Research topic, Scope and Limitations of the Study	28
Research Topic	28
Scope	29
Limitations.....	30
The rationale of the Study.....	31
The rationale for the research problem.....	31
Rationale for the methodologies to address the problem	32
Literature Review.....	33
State of Art	33
Theoretical framework.....	36
English Pronunciation	36
Segmental Features	37

Suprasegmental Features.....	38
Intelligibility	38
Perception of Spoken English	38
Teaching English Pronunciation	39
Learning new Pronunciation.....	41
Conceptual Framework.....	42
Factors Affecting English Pronunciation Learning	42
Connectivism and the digital age	42
Game Thinking	43
Gamification.....	43
Using Gamification in Second Language Acquisition.....	45
Gamification to improve English Pronunciation	46
Game Factors	47
Research Design	48
Methodological design.....	48
Research method.....	50
Research approach	52
Context of the research	53
Population and sampling procedures.....	53
Researcher's impact	54

Ethical Protocol.....	55
Data collection techniques	58
Description and rationale of the instruments	58
Characterization survey.....	58
Diagnostic Pronunciation Test or Perception of the Spoken English (POSE) Test	59
EFL Students' questionnaire.....	61
The field notes.....	63
The post-test.....	64
Validation Procedures	64
Content validity.....	64
Criterion validity.....	65
Construction validity.....	65
Pedagogical Intervention	65
Pedagogical Method.....	65
Moodle Pronunciation Course.....	66
Challenges as content units.....	67
Synchronous meetings	68
Data Analysis and Findings	69
Data management procedures	69

Qualitative instruments.	70
Qualitative instruments	70
Sample understudy characterization.....	70
Students' background with virtual and pronunciation courses.	72
Students' perceptions about Gamification and English pronunciation.	73
Diagnostic Test: Perception of the Spoken English (POSE).....	75
Segmental speech perception results.....	75
Suprasegmental speech perception results.	77
Categories.....	79
Discussion of categories.....	80
Factors affecting Participants' English pronunciation.....	80
Attitude.....	80
Motivation.	80
Exposure.....	81
Instruction.....	81
Game Factors.....	82
Game goals.	82
Challenge.....	82
Sensation.....	82

Sociality.....	82
Analysis of the Students' questionnaire	83
Hypothesis testing and operationalization of variables	84
Analysis of the Pre and Post Diagnostic Tests.....	84
Segmental Features.....	86
Suprasegmental Features. Intonation and Sentence Stress.	88
Reliability and validity of analysis and findings	89
Qualitative information process	89
Quantitative information Process	90
Discussions and Conclusions	91
Significance of the results.....	91
Pedagogical and research implications for the field of study	94
Research limitations on the present study	95
Recommendations for further research	97
Conclusions	98
References.....	99

Appendices.....	107
Appendix A Characterization survey.....	107
Appendix B. EFL Students' questionnaire	112
Appendix C. Characterization survey: data treatment question	116
Appendix D. Informed consent letter (English version)	117
Appendix E. Carta de consentimiento informado (versión en español)	120
Appendix F. Time Schedule	123
Appendix G. Sample Challenges at Moodle.....	126
Appendix H. Participants' questionnaire results.....	128

List of Tables

Table 1. <i>Approaches to Teaching English Pronunciation</i>	41
Table 2. <i>POSE Test description</i>	60
Table 3. <i>Game and English Pronunciation factors</i>	62
Table 4. <i>Sociodemographic characteristics of the sample under study</i>	71
Table 5. <i>Students' background with virtual and pronunciation courses</i>	73
Table 6. <i>Students' initial perceptions on learning pronunciation through gamification</i>	74
Table 7. <i>Vowel results POSE Test</i>	76
Table 8. <i>Consonant POSE Test Results</i>	77
Table 9. <i>Word Stress results POSE Test</i>	78
Table 10. <i>Intonation results POSE Test</i>	79
Table 11. <i>Students' questionnaire data analysis and results</i>	83
Table 12. <i>Pronunciation features scores</i>	85
Table 13. <i>Intonation and sentence stress results</i>	89

List of Figures

Figure 1. <i>Description of the Problem</i>	24
Figure 2. <i>Segmental and Suprasegmental Pronunciation Features</i>	37
Figure 3. <i>Game Thinking - Differences between games and gamification</i>	43
Figure 4. <i>Game thinking decision tree</i>	45
Figure 5. <i>Action Plan Stages of the study</i>	48
Figure 6. <i>Challenges pronunciation content</i>	68
Figure 7. <i>Box plot of data from Vowels feature</i>	87
Figure 8. <i>Box plot of data from Consonants feature</i>	88
Figure 9. <i>Game and pronunciation factors relation</i>	93

Introduction to the Research Study

The development of games, especially in the way of playing, changed radically with the video game industry's growth and settlement since the '80s. Even though the origin of gamification is placed in the business sector, it has been expanded to other areas. Specifically, gamification has moved to the education field due to Malone (1980), who developed a study of network games' motivation using gamification concepts in learning.

However, the concept dates back to 2003. Gamification, a term first used by the British Nick Pelling, designer and programmer of business software, who spread this term to give a name to a reality observed by him, according to which the "culture of the game" was a kind of revolution that was reprogramming society (Hooda, 2018; Mora et al., 2015). Gamification is a new term often denoted to game components in non-game situations to create enjoyable, fun, and motivating learning experiences (Werbach and Hunter, 2012).

Mediating in pronunciation seems to be a question. According to Saz et al. (2011), the first question is how much attention should be paid to phonology, sound discrimination, and pronunciation teaching. However, most early language pathologists admit that pronunciation has an important place in language teaching concerning other areas covered by the L2 curriculum (Anderson-Hsieh, 1989; Celce Murcia, 1991; Wong, 1986; Morley, 1987, 1988).

For most students in Colombia, no specific time is dedicated to pronunciation training during classes since it is understood that teachers correct them on possible pronunciation difficulties that appear during the EFL class (Ramírez Rodríguez, 2014; Caballero & Rosado, 2018). This phenomenon can deeply limit the phonetic competence of young students who are

immersed in an environment of their mother tongue and where the transfer to a new language alters the correct pronunciation of the L2.

The aim of implementing this action research proposal is to conduct important changes in the pedagogical praxis and the EFL in Colombia higher education. The Perception of the Spoken English (POSE) test is a fundamental tool for diagnosing the specific participants' needs to establish the gamification strategy, game elements, and pronunciation instruction. Active mediation has to be improving week by week in every meeting since the goal is to engage participants in their progress. As a beginner in this way of mediating education, I have challenged myself to appropriate technological and interactive game elements in a distant class. It is remarkable that this group of students also comes from face-to-face education methodologies that dares my pedagogical foundations on teaching English as a Foreign language. Extrinsic motivation is a crucial component of this process. Understanding the games' basic concepts becomes essential when delineating and using Gamification as a strategy to mediate English pronunciation features.

Based on these reflections, it is necessary, from the interactive learning of a language, to look for mechanisms or strategies that improve pronunciation problems that most young adult students fossilize during the process of the target language acquisition. In this sense, this study arises as an alternative for joining the technological development, framed in gamification to create a synchronous and asynchronous learning experience.

The population under study is composed of undergraduate students from the Universidad Pedagógica y Tecnológica de Colombia (UPTC), located in Sogamoso, Boyacá, Colombia. As a sample, sixteen students with different English proficiency levels according to the Common European Framework (CEFR) and educational programs were randomly selected.

The first chapter lays out the research foundations in which the rationale for the study, problem statement, research question formulation, and objectives guide the research process. The second and third chapters develop the concepts and definitions that allowed the study's understanding and interpretation. The fourth chapter focuses on the methodological design of the study. It explains the approach and design of the methodology used, the study variables, the population, the information collection instruments, and the stages in which the research is carried out.

Context of the research problem

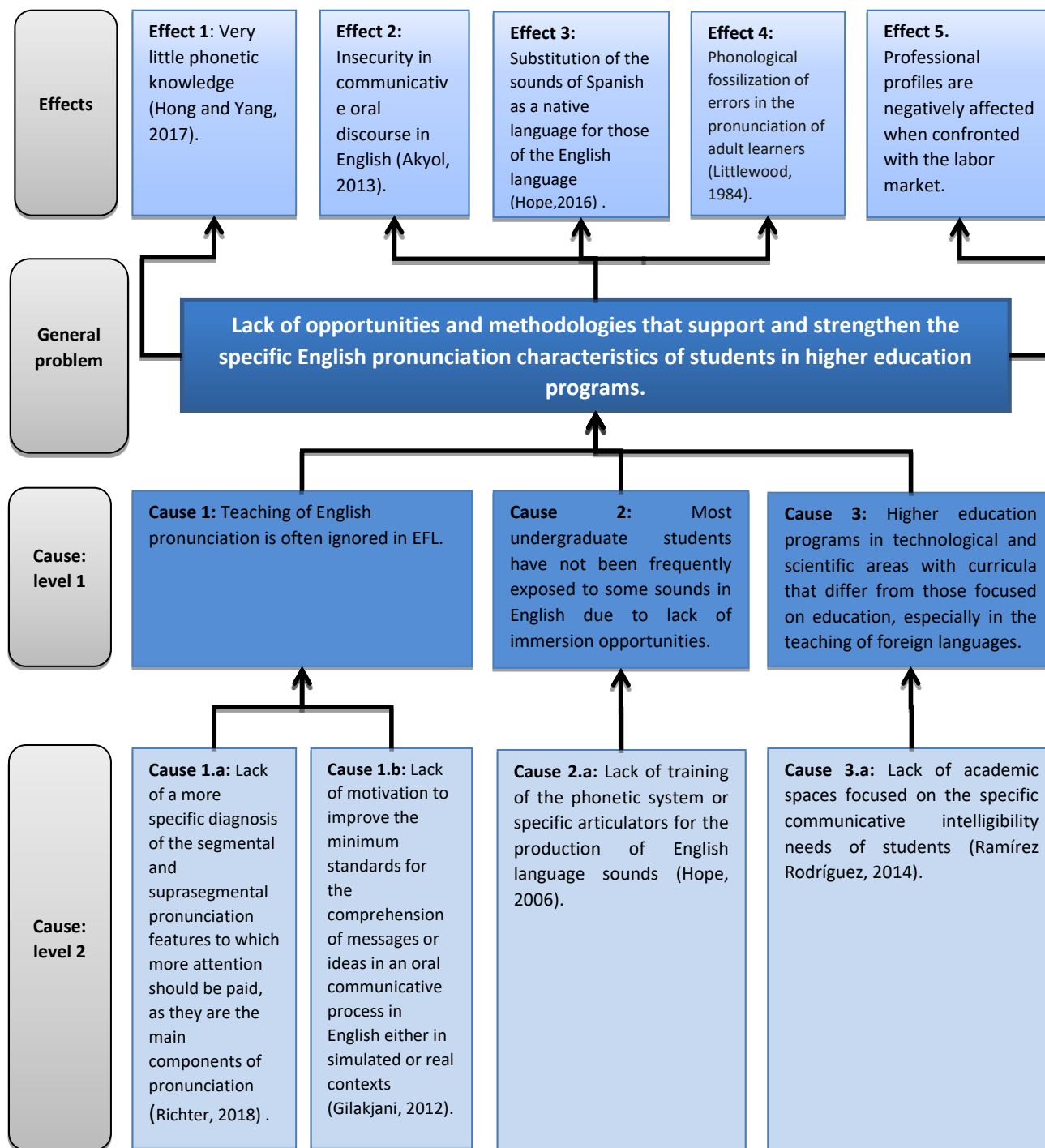
In a setting like Universidad Pedagógica y Tecnológica de Colombia, most specifically in Sogamoso headquarter, business, technological and earth sciences programs do not contemplate English in their curriculum. They do not have the same approach as the teaching programs. Still, it is a requirement for students' graduation, English pronunciation errors among other students' needs are evident when teaching English as a Foreign Language. Most of these students have not been frequently exposed to some sounds in English in their entire life. They did not have a reason or opportunity to develop the muscles in the tongue, mouth, and throat specific to those sounds. Therefore, as Hope (2006) establishes, English learners tend to substitute sounds in Spanish as a mother tongue for English speakers. These substitutions are logical and predictable but affect language learners' clear speech. Intonation and stress are other pronunciation issues when students speak English since their intelligibility is also negatively affected.

Other conditions that promote these pronunciation problems in this group of EFL undergraduate students have to do with the lack of a more specific diagnosis of the segmental and suprasegmental pronunciation features to which more attention should be paid since they are the main components of pronunciation; vowel and consonant sounds, stress, and intonation could

affect English learners' speaking intelligibility. Unfortunately, English pronunciation teaching is often ignored in EFL worldwide. The slight importance of pronunciation has led to students gaining very little phonetic knowledge (Hong & Yang, 2017).

International business employees, researchers, engineers, and other professionals demand English writing and reading skills and speaking competencies. "More and more today, in countries throughout the world, careers in commerce and trade, science and technology, health care, transportation, industry, manufacturing, and many other major fields of study lay high English language requirements on employees, both in their home country and in assignments around the world" (Morley, 1995, p.492)

early authors who have carried out the main studies where the central awareness is on how pronunciation issues could affect their professional profile negatively (Anderson-Hsieh 1989; Celce Murcia, 1991; Morley, 1987, 1988; Wong, 1986). With a globalized world, international trades, and even research fields, undergraduates not only need to prepare in their specific area of knowledge, but the acquisition of English as a foreign language has become a priority to become professionals. Specifically, nowadays, oral communication skills and clear speech evidence proficiency in the target language. The problem tree analysis is shown in Figure 1.

Figure 1*Description of the Problem*

Note. Problem tree analysis. Own authorship.

Universidad Pedagógica y Tecnológica de Colombia (UPTC) is a national university placed mostly along Boyacá, but it also includes campuses in seven states of Colombia. Sogamoso Campus is also well known for having more engineering, business, and technology programs. Students enrolled in these programs have to take six levels of EFL as a requirement to graduate. These 6 English Levels are not part of the program curriculum and have been through many syllabuses and content changes to fulfill language undergraduates' needs. Approaches and methods to meet professional and academic needs have to leave language intelligibility aside from what is observable when students in the last levels of English show lots of mispronunciation issues when English is used in the proposed academic activities. Pronunciation errors at the Segmental and Suprasegmentally levels in the speech of learners of English at Universidad Pedagógica y Tecnológica alter their intelligibility.

It is necessary to understand the needs of these students, particularly groups of thirty students between sixteen to thirty years old enrolled in different engineering and business majors in six different levels for pre-intermediate EFL programs.

It is important to understand that pronunciation is an integral part of foreign language learning since it directly affects learners' communicative competence as well as performance. Limited pronunciation skills can decrease learners' self-confidence, restrict social interactions, and negatively affect estimations of a speaker's credibility and abilities" (Akyol, 2013, p.1457).

Authors like Dalton (1997) point out the teachers' comfort in language skills instruction where English instruction has been devoted to enhancing communicative skills without considering pronunciation features often because of a lack of basic instruction in articulating phonetic sounds properly. It would not be wrong to say that, within the teaching of English as a

foreign language, pronunciation has historically been the most questioned and ignored aspect, to the point that English teachers do not usually teach pronunciation, at least in a planned way.

When they do, it focuses on correcting students informally in the situations where they make a mistake in their oral production, especially if it affects meaning (Consentino & Muños, 2016).

In Elliott's study on foreign language phonology, the author states: “teachers tend to view pronunciation as the least useful of the basic language skills. Therefore, they generally sacrifice teaching pronunciation to spend valuable class time on other areas of language” (1995, p.531). This neglect of pronunciation teaching may be why students in these specific areas find it difficult to develop clear and intelligible communication in English.

Furthermore, teachers are not inhibited from selecting supplementary resources to focus on the students' learning of the target language or support it and improve specific language skills, grammar or lexicon. It is important to mention that textbooks are support tools that teachers use since assessments were initially based on grammar content and oral skills. This year (2020) has implemented other pilot-test approaches, such as Critical Literacy (Schraw and Robinson, 2011) and Project-Based Learning (PBL)(Dressler, R., Raedler, B., Dimitrov, K., Dressler, A., & Krause, 2020). However, with this change of syllabus and methodology at each EFL level at the Sogamoso UPTC headquarter, students, do not have specific courses or topics that emphasize EFL pronunciation precisely because the faculty programs are not immersed in language education. For this reason, it is essential to reflect on how FL teachers handle pronunciation in language acquisition intervention. Oral communication deserves careful attention since most errors that are not corrected in a timely manner tend to fossilize (Littlewood, 1984). Students in contexts where English is not their native language or those who have not had the opportunity for language immersion need to acquire solid speech skills to deal with real situations where

intelligible discourse is required for establishing communication with others, particularly in their professions.

Research questions, objectives and hypothesis

Research question

How do gaming factors in English as Foreign Language (EFL) mediation strengthen specific pronunciation features in UPTC Sogamoso undergraduate students?

Objectives

General Objective. To analyze the gaming factors in English as a Foreign Language (EFL) mediation to strengthen the specific features of students' pronunciation at UPTC Sogamoso.

Specific objectives. Some specific ones are established to meet up the main objective of the research:

To determine specific students' pronunciation errors at the segmental and suprasegmental levels through the POSE test.

To integrate game elements into English pronunciation instruction that meet undergrads' pronunciation needs.

To specify whether there are meaningful improvements in English pronunciation's specific features when integrating Gamification as an e-learning-teaching strategy.

Research topic, Scope and Limitations of the Study

Research Topic

This research's main topic is focused on Gamification as a strategy to foster EFL Apprentices' Speaking Intelligibility and Pronunciation. One aspect of language acquisition we can state with relative confidence is how to teach pronunciation, the main topic of this research. When pronunciation issues are presented in an EFL context, we, as teachers and researchers, come to make some possible choices to overcome them.

Even though language teachers do not use the latest pronunciation methods in their foreign language conversation classes, pronunciation is still an important part of the language learning process. In particular, in conversation classes, language teachers do not supply their students with the necessary phonetic or phonological knowledge about the segmental and suprasegmental elements of English pronunciation, which makes it unfortunately impossible for students to eliminate fossilized pronunciation errors, achieved a high level of pronunciation in relation to the segmental and suprasegmental characteristics of English pronunciation, developed oral skills in terms of both precision and confidence, improved listening comprehension, and the progress of self-confidence and autonomy (Hismanoglu & Hismanoglu, 2010)

University education current faces unprecedented challenges, being responsible for the training of professionals who must insert themselves into a world not only mediated by constant technological advances but also requires specific skills in their area of study and also related personal skills mainly with communication, thought critical, problem solving, the persistence and collaborative work. These skills are widely addressed by the teaching technique called

gamification, which is developed as one of the means in this research work to foster students' pronunciation and intelligibility in engineering, business, and technology programs.

Scope

English pronunciation instruction is still ignored in many EFL settings, including the Colombian context, although listening and speaking English skills are somehow incorporated in the curriculum and taught to prepare students with adequate communicative competence.

There are also many auditory and visual resources on the internet. Students can appropriate in their English learning process by practicing speaking to a much greater extension than before, but this extended oral practice does not necessarily involve conscious pronunciation practice. English instruction in Colombia usually incorporates four main communicative sorts: listening, speaking, reading and writing and the teaching programs curricula call attention to English pronunciation by focusing on phonological charts theories, other programs such as engineering, earth sciences and business do not have any specific instruction of these matters in their EFL syllabuses. Phonetics instruction is partially given as tiny tips in Colombia's primary, secondary, and even university education. As Ramírez Rodríguez (2014) supports:

It may be concluded that the role of pronunciation in the proposal the Colombian Ministry of Education makes for English teaching is not clearly stated because pronunciation is mentioned in very general terms, thus limiting the approach that can be used for the teaching of all its features. (p.19)

This research focuses on challenging an existing problem by most students in an EFL context as Colombia. This problem has to deal with a lack of knowledge of English pronunciation in Colombian higher education, specifically in engineering programs; hence, the

need to create and integrate an innovative pronunciation strategy by implementing Gamification to engage students and guide them to overcome this issue. Action research has been chosen to go after a method that allows transforming this particular problem or planning and implementing changes in particular teaching-learning contexts to improve practice and provide understanding for these stakeholders. Carr & Kemmis (1986) point out the following about this type of research:

It is a form of self-reflective enquiry undertaken by participants in social situations in order to improve the rationality and justice of their own practices, their understanding of these practices, and the situations in which the practices are carried out. (p.26)

By using this research design, the current research plans, acts, observes and reflects on the game and learning pronunciation factors that affect a group of Colombian university students' English pronunciation and intelligibility toward implementing “game-based elements and mechanisms in a non-game environment” (Wood & Reiners, 2014). In addition, this study also intends to discover how specific pronunciation features or issues at the segmental and supra-segmental level of the speech in a group of Colombian learners of English at Universidad Pedagógica y Tecnológica could be improved.

Limitations

The proposed activities in this research were of two types, synchronous and asynchronous. The proposed asynchronous activities required time and autonomous work by the student before each synchronous meeting. The first ones were related to reading the information, reviewing video tutorials, listening and speaking practice, and recording. In this context, the

possible limitation was the noncompliance of the tasks or partial compliance due to the technological resources lack such as the Internet

An efficient connection to the Internet and technological tools such as computers and cell phones were necessary to carry out the gamification strategy of this project, so when one of the participants had problems accessing and using these elements, it became a limitation to achieve reliable research results.

The rationale of the Study

The rationale for the research problem

English Pronunciation is one of the matters that has caught the researcher's attention since the opportunity to meet Dr. Donna Hope, the director of the American English School in Atlanta, Georgia, the USA, as a speech-language pathologist who has studied adult speech and language. "It's not good unless you're understood" (Hope, 2006). Thus, teaching pronunciation appears to be a question. Stern states that the first question is how much attention should be attached to phonology, sound discrimination, and pronunciation teaching. However, most methodologists admit that pronunciation has an important place in language teaching relative to other areas covered by the L2 curriculum (1992).

Other questions came to the researchers, such as how to teach pronunciation. However, with the changing situation in which health emergency policies occurred in our country, most face-to-face context methodologies were changed to Virtual Learning Environments (VLE) to support distance mediation. This study has also addressed how this pandemic has been happening to the face-to-face university teaching experience in self-learning of teaching practice in the online classroom in a face-to-face education program of a higher education center.

Conducting the pedagogical mediation in the virtual environment of face-to-face undergraduate students requires specific knowledge on language and pedagogy and technology, innovation, and creativity skills. However, knowledge is not an equal successful application.

Rationale for the methodologies to address the problem

Gamification is a new concept often meant to use game components in non-game situations to create enjoyable, fun, and motivating learning experiences (Werbach and Hunter, 2012). Understanding the games' basic concepts becomes essential when delineating and using Gamification as a strategy to mediate English pronunciation features.

This study could represent one of the first steps on gamified English pronunciation instruction in Colombia, and it also allows EFL teachers in the UPTC context to understand the importance of incorporating pronunciation instruction in a meaningful way. Furthermore, gamed thinking could be considered a positive change in learners' professional development and the target language. Therefore, teachers must employ suitable and effective mediation strategies that improve students' clear speech and feel communicative confident when using a language that is not their mother.

Pronunciation instruction should be incorporated into EFL teaching methodologies, not as a translation method but innovatively and creatively. English learners are primarily interested in improving their pronunciation in the target language, which is advantageous for innovating and generating these spaces in education. The appropriate use of technology is a great tool in language teaching. It plays an interesting role in the creativity of any teacher as a mediator of competencies and skills in students to incorporate their knowledge in solving problems and situations not only in their field of study but also at an interdisciplinary level.

Literature Review

This chapter corresponds to the literature review under three referential and documentary sections: state of the art, theoretical framework, and conceptual framework. First, state-of-the-art is based on teaching pronunciation background concerns and the studies that have emerged, subsequently incorporating technological and game elements as strategies to solve oral intelligibility problems when learning English. Next, the theoretical framework discusses pronunciation theory, teaching approaches dating back to the 1980s, and pronunciation learning. Finally, the conceptual framework consolidates the main scope of this study. This chapter's final part lists the factors affecting English pronunciation learning, connectivism and the digital age, gamification in the game thinking approach (Marczewski, 2015), gamification to foster English learning and English pronunciation, and gamification factors.

State of Art

Main early studies have conducted most serious concerns on how pronunciation problems in English as a Foreign Language (EFL) negatively affect apprentices' intelligibility and confidence when speaking (Anderson-Hsieh, 1989; Celce Murcia, 1991; Morley, 1987,1988; Wong, 1986). Littlewood (1984) describes fossilization in English pronunciation as those permanent errors coming from foreign accents and kept by most young and adult learners without any improvement or progress. Stern (1992) and Dalton (1997) also inquire how much importance should be given to phonology, sound discrimination and teaching pronunciation. This same inquiry is aimed by authors like Hope (2006), who introduces it in her most popular pronunciation coursebook: "when you learn a second language, without learning its pronunciation, you tend to substitute your set of sounds for those in a second language. The particular sound substitutions you will make are logical and predictable". (p.3)

Hismanoglu & Hismanoglu (2010) calls the notion of lack of knowledge on English segmental and suprasegmental pronunciation features as one of the causes that makes students fossilized pronunciation errors, fail pronunciation, and dismiss accuracy and fluency skills. Listening comprehension, self-confidence and autonomy are other learners' deficiencies regarding this postulate. Lack of communication skills can diminish students' self-confidence, limit social exchanges abilities, and negatively affect speakers' reliability and skills (Akyol, 2013). Quesada Vázquez & Romero's (2020) studies are a clear example that the lack of time and pronunciation training is still latent in most English learning contexts:

Pronunciation could be considered the ugly duckling of the English as a foreign language teaching (EFLT) field. Although many researchers and teachers agree with the significant role that pronunciation plays when trying to communicate in the second language, learning and practicing pronunciation within the classroom is very rare and, sometimes, even inexistent. (p.211)

On the other hand, with the evolution of new technologies in the educational environment, the teacher-mediator acts as an intermediary between the content and the student, offering strategies for the student to discover significant learning. "Pedagogical mediation is a useful tool to help the actors of education to interpret these experiences and realities" (Delgado, 2013). Some studies (Shewell, 2004; Arandia, 2009; Saz et al., 2011; Pokrivčáková & Pokrivčáková, 2014; Hong & Yang, 2017) that have emerged in the field of EFL teaching, and more specifically in teaching-learning of English pronunciation, examine computer programs for teaching pronunciation as the core experimental tool to explore the highest level of pronunciation improvement. They differentiate one phoneme from another, make predictions about stress placement in words and encourage teachers to merge pronunciation in their classroom, which

needs to be prepared with these computer tools to intensify their success in teaching English pronunciation. Authors (Saz et al., 2011; Henrichsen et al., 2018; Cox et al., 2019) discuss the emerging possibilities to enhance pronunciation instruction in L2 (second language) teaching with the support of multimodal tools integrating new advances in speech technologies in fields such as Computer-assisted Pronunciation Training Applications (CAPT) and Automatic Speech Recognition (ASR).

The integration of new technological concepts to motivate students to improve their fluency, such as Gamification, a new pedagogical strategy used initially with great business success and later in current studies of foreign language learning (Figueroa Flores, 2015). Game studies have also highlighted the pleasure in digital video games because of the illusions gamers live; they create another life in another body called an avatar, the figures in the games such as Warcraft (Coelho, 2016). Existing research on game pedagogy and game elements focused on phonics applications developed. The pedagogical game element here is an application created to provide challenges that engage players by making them learn in a more exciting, meaningful and rewarding way. Students participate in a game-based application to reinforce their cognitive skills, phonemes and word stress. (Shroff et al., 2016; Hong & Yang, 2017).

Within the research and studies that address the teaching of English pronunciation, it can be concluded that the greatest recommendation found is that institutions such as Universities and schools should provide teachers with sufficient facilities and appropriate computer technology for pronunciation practice to increase students' confidence, eliminating their fear of mispronouncing sounds within English word or phrase practice. Using interactive technologies and tools increases learner motivation and confidence (Gilakjani, Abbas Pourhosein & Sabouri, 2016).

All the studies reviewed in this literature agree on the positive results of gamification appropriation in learning environments regardless of the target language. However, Dehghanzadeh et al. (2019) postulate that a few of these works of literature report on the specific elements of gamification related to both the outcomes and the students' learning experiences. Therefore, the recommendation is remarkable to address gamification at a more specific level, identifying game elements that contribute to the learning outcomes and establishing the advantages and disadvantages of the implemented game elements in the teaching English process. There is evidence of the gaming elements used in English training, but not in specific courses or pronunciation instructions. The literature focuses more on the programs' design and applications that offer a degree of autonomous student participation or diagnosis and evaluation of the errors that a learner may present in learning English.

Theoretical framework

English Pronunciation

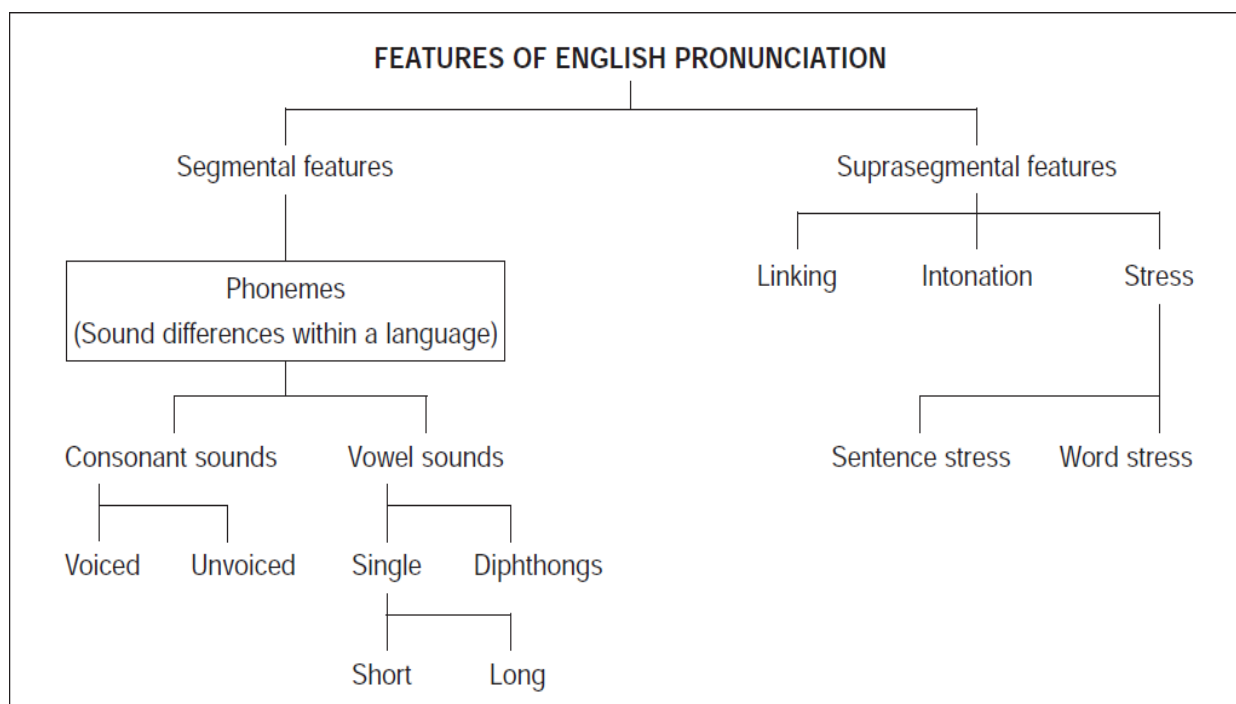
Pronunciation arose as a systematic field of study by the end of the 19th century when the IPA (International Phonetic Association) was founded in 1886. From that time, the focus on teaching pronunciation in ESL/EFL environments has been a variable topic (Atli & Bergil, 2012). Quesada Vázquez & Romero, (2020) describes Pronunciation as:

The key factor to guarantee successful oral communication. It is not uncommon to have students in class who might have an advanced command of vocabulary and grammar in the target language but fail to be understood and transmit the message because their pronunciation is poor. (p.211)

Solomon (2019) refers to pronunciation as how segmental, and suprasegmental features are used in a spoken language. These main elements of pronunciation are represented in Figure 2.

Figure 2

Segmental and Suprasegmental Pronunciation Features



Note. Features of English pronunciation. (Solomon, 2019) Source: Burns, 2003 p.

Segmental Features

Segmental pronunciation features introduce all the phonemes or consonant and vowel sounds. Most consonants are voice or voiceless and classified according to their articulation, and vowels differ according to the tongue position. “You can segment the one sound into parts because you know English. The ability to analyze a word into its individual sounds does not depend on knowledge of spelling” (Fromkin et al., 2012).

Suprasegmental Features

“Speech sounds that are identical in the place or manner features may differ in length (duration) pitch or loudness” (Fromkin et al., 2012). Intonation, rhythm, and stress are usually heard in one’s intonation Suprasegmental features (Kennedy, 2013). “The musical aspects of pronunciation”(Taylor, 2013).

Intelligibility

Morley (1991) focuses on developing students' fundamental intelligibility, practical communicability, self-confidence, speech control skills, and speech modification strategies. Taylor (2013) points out that although some researchers define intelligibility with slightly different concepts, most agree that intelligibility refers to the ease of making oneself understood. Without some segmental or suprasegmental error distracts or causes listeners to understand the message intended to communicate.

Perception of Spoken English

Hewlett (1990) observes a relationship between what a learner can hear and the sounds they can produce. Speech output is a dynamic process, instead of a product, made up of four different phases: "perception, programming, processing, and execution" (p. 14). Lee et al. (2020) state, “Theoretical frameworks for pronunciation instruction (PI) can be categorized as either being perception- or production-based” (p. 2). The focus of this SLM (Speech Learning Model) study is to determine which instructional method would lead to the highest achievement of segmental and suprasegmental outcomes. Consequently, pronunciation accuracy is understood as the effective production of the characteristics of the ASE (American Standard English).

Teaching English Pronunciation

Main considerations about Teaching English Pronunciation have been proposed, but the most common ones are the intuitive-imitative approach, the analytic-linguistic approach, and the integrative approach, which are highlighted among the worldwide literature (Celce-Murcia, 1996; Chen, 2007; Hismanoglu (2010); Lee, 2011; Roohani, 2013; Rojas & Serrano, 2013; Behzadi & Fahimniya, 2014; Nguyen, 2019; Quesada & Romero, 2020). The learner's listening and imitation skills are features of the intuitive-imitative approach: English rhythm and sounds do not involve any explanatory information; it relies on the "availability, validity and reliability" of good listening patterns. (Rojas & Serrano, 2013). The student listens and imitates the English sounds and rhythms with no explicit information. The popularly known as "language laboratory and audio-lingual method" support this approach from the 60s to the 80s, even many contemporary teachers of English still maintain this approach (Behzadi & Fahimniya, 2014).

The analytical-linguistic approach involves using knowledge and resources, e.g., voicing tables articulation profiles, phonetic alphabet, comparative information, and additional tools to assist listening comprehension, imitation, and production. In this way, the apprentice is explicitly informed about the target language rhythms and phonemes (Rojas & Serrano, 2013).

Teachers implement intensive listening, task-based activities, intensive oral practice, and deep learning in the integrative approach. Students develop pronunciation-centered listening tasks to enhance their EFL pronunciation. This approach emphasizes the suprasegments as practiced in extended speech beyond the segmental level (Hismanoglu & Hismanoglu, 2010; Rojas & Serrano, 2013; Behzadi & Fahimniya, 2014)

Today each of these approaches has varied or have been adapted and integrated to new ICT (Information and Communication Technologies) and LCT (Learning and Communication Technologies). It is observable how easily we access them in approaches such as gamification for teaching a language in its most specific and necessary aspects.

Hismanoglu & Hismanoglu (2010) also refers to a chronological change of the main approaches to pronunciation instruction founded on Celce-Murcia, M., Brinton, D.M., & Goodwin, J.M. (1996), as shown in Table 1.

Table 1*Approaches to Teaching English Pronunciation*

Years	Approach	Definition
The late 1800s and early 1900s (1940s- 1950s)	Direct Method	Teachers provided students with a model for native like speech. By listening and then imitating the modeler, students improved their pronunciation.
(1960s)	Audiolingual Method in USA, Oral Approach in Britain	Pronunciation was taught explicitly from the start. Learners imitated or repeated after their teacher or a recording model. Teachers used a visual transcription system or articulation chart. Technique: minimal pair drill
(1970s)	Cognitive Approach	This de-emphasized pronunciation in favor of grammar and vocabulary because (a) it was assumed that native like pronunciation was an unrealistic objective and could not be achieved and (b) time would be better spent on teaching more learnable items, such as grammatical structures and words
(1970s)	Silent Way	The learners focused on the sound system without having to learn a phonetic alphabet or explicit linguistic information. Attention was on the accuracy of sounds and structure of the target language from the very beginning. Tools: sound-color chart, the Fidel charts, word charts, and color rods.
Mid-late 1970s (1980s-today)	Community Language Learning	The pronunciation syllabus was primarily student initiated and designed. Students decided what they wanted to practise and used the teacher as a resource. The approach was intuitive and imitative.
Mid-late 1970s (1980s-today)	Communicative Approach	The ultimate goal was communication. Teaching pronunciation was urgent and intelligible pronunciation was seen as necessary in oral communication. The techniques used to teach pronunciation were: listening and imitating, phonetic training, minimal pair drills, contextualized minimal pairs, visual aids, tongue twisters, developmental approximation drills, practice of vowel shifts and stress shifts related by affixation, reading aloud/recitation, recordings of learners' production
20th century More recent	Grammar-translation and reading-based approaches	Oral communication was not the primary goal of language instruction. Therefore, little attention was given to speaking, and almost none to pronunciation.
	Total Physical Response	Students would begin to speak when they were ready. They were expected to make errors in the initial stage and teachers were tolerant of them.
	Natural Approach	The initial focus on listening without pressure to speak gave the learners the opportunity to internalize the target sound system.
Today-	New directions	New thoughts from other fields, such as drama, psychology, and speech pathology. Techniques: the use of fluency-building activities, accuracy-oriented exercises, appeals to multisensory modes of learning, adaptation of authentic materials, and use of instructional technology in the teaching of pronunciation

Note. Retrieved from "Language teachers' preferences of pronunciation teaching techniques: traditional or modern?" by Hismanoglu & S. Hismanoglu. 2010, *Procedia - Social and Behavioral Sciences*, 2 (2), 983–989. <https://doi.org/10.1016/j.sbspro.2010.03.138>

Learning new Pronunciation. Learning new pronunciation entails the changing habit; an individual can use different positioning of the articulators (i.e., lips, teeth, tongue, soft palate) and other manners of production (Hope, 2006).

Conceptual Framework

Factors Affecting English Pronunciation Learning

According to Celce-Murcia et al. (1999), some general and important factors affect the learning of pronunciation of EFL: age of the learner, native language, exposure to the target language, amount and sort of previous pronunciation knowledge, attitude, aptitude, motivation, natural ability. Tanner (2012) proposes culture, motivation, and level of instruction as factors to acquire pronunciation. Pourhosein (2012) lists a series of factors affecting English pronunciation learning, among which we find: attitude, motivation, instruction, and exposure to target language. Gilakjani (2012) mentions attitude, motivation, instruction, and exposure to the target language as the main factors in their study. Finally, Richter proposes age, gender, musicality, attitude and identity, motivation, anxiety, formal pronunciation instruction, exposure to the target language as the most commonly associated factors “with L2 phonological development” (2018, p.341).

Connectivism and the digital age

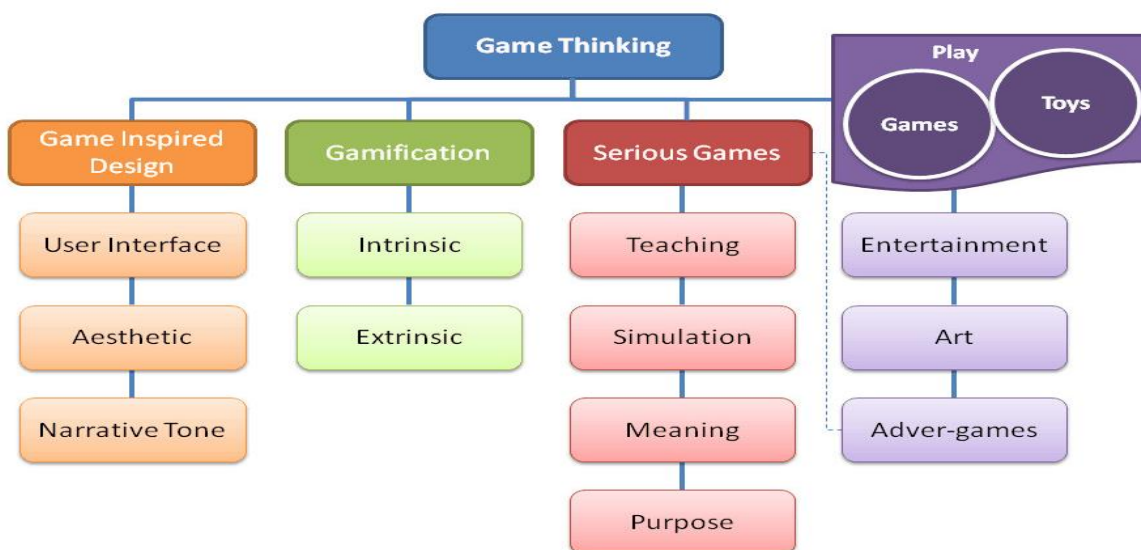
Connectivism is the current stage of development in the Knowledge and Information Society. Siemens (2004) presents connectivism as a theory that surpasses "the three great theories" of learning. From this last idea, Zapata-Ros (2015) deduces that the central factors of connectivism are two: first, that learning is only knowledge (content) useful in different contexts and that therefore it can be stored in devices and, second, that the individual must have a disposition must have competencies, skills, to use that information - it is not clear if it is a matter of inferring it or, if as it seems to be more important, connecting it.

Game Thinking

Understanding the elementary game concepts of the s becomes fundamental when delimiting and using Gamification as a strategy to mediate the characteristics of English pronunciation. Some of these concepts are shown in Figure 3.

Figure 3

Game Thinking - Differences between games and gamification



Note. Retrieved, from Game Thinking - Differences between Gamification & Games by Marczewski, A. 2015. <https://www.gamified.uk/gamification-framework/differences-between-gamification-and-games/>

Gamification. An interesting organization of concepts about gamification is developed by Marczewski (2010), who proposes a hierarchy of desegregated theory of game thinking. Gamification is seen as a subcategory that involves the appropriation of game elements to motivate intrinsically and extrinsically the learning process and is far from Game inspired design, serious games and playing concepts, as seen in Figure 2. For instance, game thinking

strategies, such as gamification, have emerged as innovative solutions in educational processes. However, Gamification is not a relatively new term since its use has started to cover teamwork strategies in digital marketing; gamification usually denotes the application of game elements in situations unrelated to the game itself to create pleasant, fun, and motivating learning experiences in students (Werbach & Hunter, 2012).

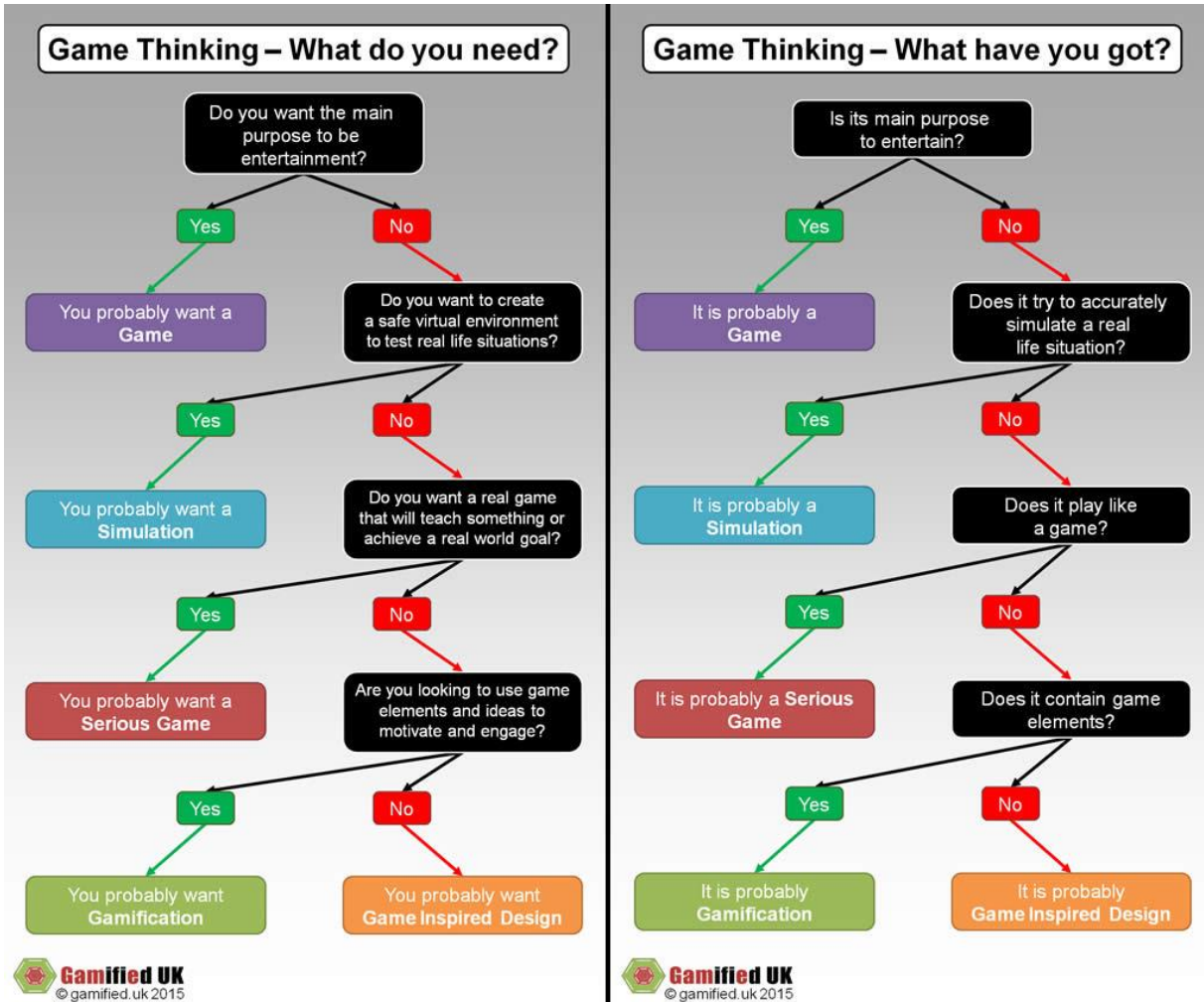
Wood & Reiners (2014) refers to Gamification as a new way of thinking about how the game elements can improve the process and make the users take part in them without forgetting the set of works made at serious games. Gamification also applies or integrates game elements in non-game environments (Alsawaier, 2019).

Gamification has been extensively used in educational environments and instructional practices (Dichev and Dicheva 2017) to enhance students' engagement and motivation through the employment of game design elements outside of a fully-fledged game (Barata et al. 2015; Deterding et al. 2011; Kapp 2012; Nand et al. 2019) (Wiemeyer et al., 2016)(Toda et al., 2019)

Marczewski (2015) postulates an interesting way to determine if the purposes set in work are just a game, a serious game, a simulation, or what is intended in this study, Gamification. Hist "decision tree" is shown in Figure 4.

Figure 4

Game thinking decision tree



Note. Retrieved from “Game Thinking - Differences between Gamification & Games” by Marczewski, A. (2015). *Game Thinking. Even Ninja Monkeys Like to Play: Gamification, Game Thinking and Motivational Design* (1st ed., pp. 15). CreateSpace Independent Publishing Platform. <https://www.gamified.uk/gamification-framework/differences-between-gamification-and-games/>

Using Gamification in Second Language Acquisition

“The integration of gamification as pedagogy into the educational domain allows instructional designers to assess the effect of games on the learning behaviours of students.

Hence, the use of gamification as pedagogy provides numerous benefits for education” (Shroff et al., 2016, p.113).

According to Werbach & Hunter (2015), most of the literature suggests that gamification for second language learning may be related to language content, commitment, satisfaction and motivation.

According to Figueroa Flores (2015), the use of Gamification in learning a language has involved several tools for the language learning process improvement and students’ motivation toward their learning process. The objective is that the educator can combine these tools with the suitable language learning approach, method or strategy and create meaningful experiences with gamification that are not only based on a game-thinking mindset but a techno-constructivist mentality.

Gamification to improve English Pronunciation

With the evolution of language teaching approaches, technology inclusion in didactics and game elements have been incorporated as a didactic strategy in almost all pedagogical fields. Serious games and apps are an immersive method of engaging English learners in practicing and improving English pronunciation. “By adding appropriate audio and gaming components, mobile apps create an especially rich, engaging and immersive learning environment, and offer that environment at any time and place based on students’ preferences” (Shroff et al., 2016 p.113)

In Barcomb & Cardoso's study (2020), a gamified Moodle site was designed so that students could practice L2 pronunciation, and the fact that all participants have completed the tests and the gamified missions indicated that students took responsibility for their own practical pronunciation progress while being rewarded with points in this gaming environment.

Game Factors

It is important to define the word factor in this study before delving into the concept of game factors. “The word “Factor” refers to the elements important for achieving a specific dimension” (Tahir & Wang, 2018, p.680). This first concept delimits the factor essential to achieving a specific field's objectives.

Several game factors approaches have emerged; however, in this study, the most important ones in recent years have been compiled, focusing on the essential characteristics in game design. Shi & Shih's study (2015) presents a criteria-based categorization of game factors to guide the design and testing of educational games through the combination of game elements. The main factors described here are game goals, game mechanism, interaction, freedom, game fantasy, narrative, sensation, game value, challenges, sociality, and mystery.

Wiemeyer et al. (2016) present seven-game factors based on user experience and holistic approach: sensory and imaginative immersion, tension, competence, flow, negative affect, positive affect, and challenges. The users' reactions also determine the game factors during their experience: “Game Factors generate Affective-Cognitive Reactions that absorb users in playing the game and positively influence the learning.” (Tahir & Wang, 2018, p.683). Likewise, Hooda (2018) relates limited player engagement to the applied interface and the factors that decide the engagement process.

Research Design

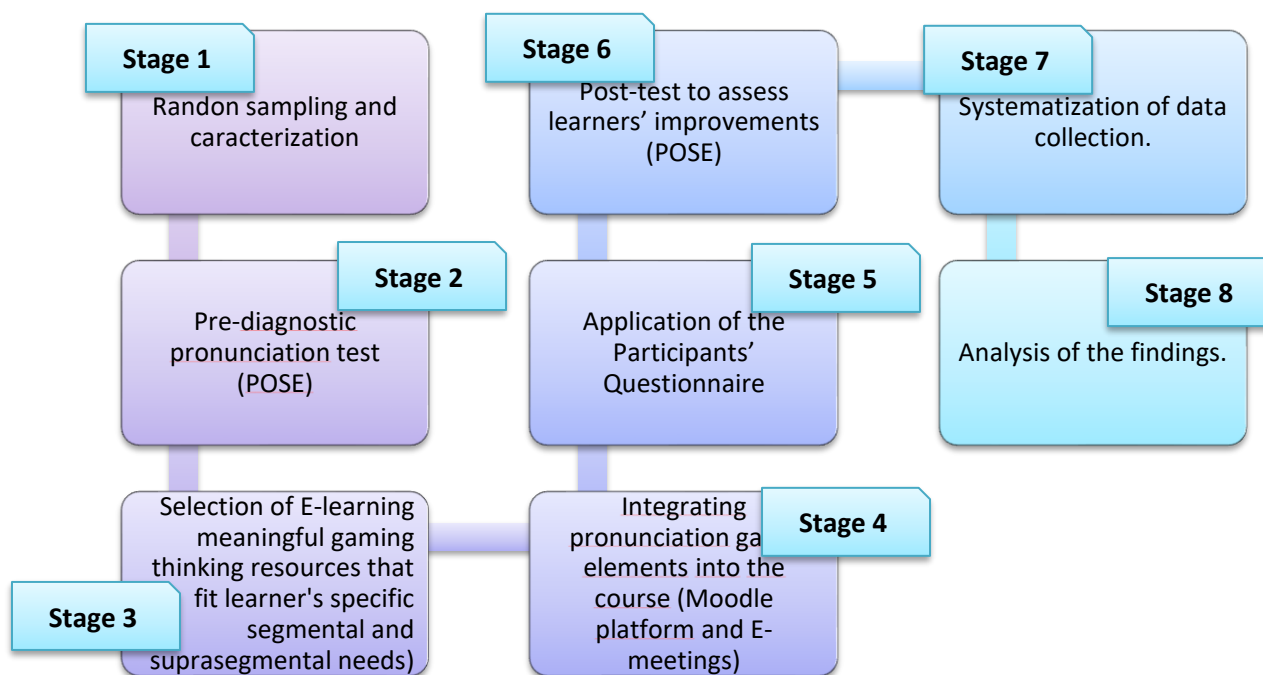
This chapter specifies the methodological design used to obtain the information needed for this study. In addition, the elements and the stages necessary to analyze the gaming factors in English as a Foreign Language mediation to strengthen the specific features of students' pronunciation at UPTC Sogamoso are also described in this section.

Methodological design

The proposed methodological design is a simple process based on the action research approach. Eight stages of inquiry are structured and guided, as seen in Figure 5.

Figure 5

Action Plan Stages of the study



Nota. A brief description of the action research procedure proposed. Own authorship.

The research process involves the next strands:

Stage 1. Call for participation in the course and participants' characterization. A registration call was sent to the students' e-mail addresses, and only those who registered first were considered for the course development and thus for the realization of this study. A consent form, acceptance and course guidelines were also sent to these participants through their e-mails.

Stage 2. Perception of spoken English diagnosis. Once the participants were set up, the POSE test was available for the group to be taken. The main purpose of this stage was to discover specific problem areas in the participants' perception of spoken English.

Stage 3. E-learning meaningful gaming thinking resources that fit learners' specific segmental and suprasegmental needs. Before this stage, a database as a source with useful pronunciation games and online resources has been drawn up; those that suit most the sample population's pronunciation needs were weekly integrated into the Moodle course platform and synchronous meetings.

Stage 4. Integration of interactive pronunciation gaming thinking tools into the English pronunciation course. (Asynchronous and synchronic meetings). A tracking process was conducted in this stage with observations, recordings, and filling in a reflective diary at trello.com, including mainly perceptions, outcomes, and thoughts of each virtual meeting.

Stage 5. Application of the Participants' Questionnaire focusing on game and learning pronunciation factors. It was also requested learners' perceptions and awareness about the course; the game thinking elements proposed speaking and their pronunciation process.

Stage 6. Post-test to assess learners' improvements. This test was designed and applied through a game-based tool such as Kahoot to assess the same needs patterns obtained from the POSE test and determine if improvement has occurred.

Stage 7. Classification, tabulation, codification and systematization of data collection.

Stage 8. Analysis of the findings. Reflective description of the effects of game intervention in pronunciation instruction.

Research method

According to Hernández, Fernandez, and Batista (2006), the research developed consists of a mixed or nested study, framed within the quantitative and qualitative methods; since a review of the situation of undergraduate students was made to identify the level at which their English pronunciation (study variable) and based on this integrate gamification as a pedagogical strategy (study variable) conducive to improving English pronunciation features.

The qualitative method seeks to interpret the reality of the educational setting under study to English pronunciation in higher education students. For this purpose, the technique of participatory observation was used to monitor the students under study through e-meetings recordings and systematic records in field journals at trello.com, and opinion surveys were applied to students to collect information to interpret the existing reality and explain the cause-effect relationship that affects the low level of English pronunciation. In essence, this method seeks to interpret the opinions, thoughts, and reflections of the subjects participating in the study.

From the quantitative method, we seek to estimate the English pronunciation variable, for which the test application technique (POSE test) was used to orient from the initial or diagnostic phase, that is, pre-test and the final phase after the development of the didactic intervention or post-test. Through inferential statistics, the difference in means was intended to apply the (Student, Wilcoxon, Friedman, Anova's T-test or the one that fits the data) to demonstrate significant differences between the before and after in the students' English pronunciation.

This research involves undertaking an action research study by introducing more deeply pronunciation learning through game elements that enhance apprentices' segmental and suprasegmental aspects suggested by Morley (1991). Initial interpretations are tested after implementing the POSE test and the procedure stages are the way to track what is needed to be improved or changed. In this research, different points of view to reach the analysis categories and a conclusion are taken into account.

This research focuses on challenging an existing problem by most students in an EFL context, specifically in Colombia. This problem has to deal with a lack of knowledge of English pronunciation in Colombian higher education; hence, the need to create and integrate pronunciation instruction by implementing in-depth strategies and gaming thinking to engage students, attract their attention and motivate them to overcome fossilized pronunciation errors. This type of study has been chosen to go after a method that allows transforming this particular problem into opportunities to innovate education. Action research is a disciplined inquiry done by a teacher with the intent that the research informs and changes his or her practices in the future. This research is carried out within the context of the teacher's environment—that is, with the students and at the school in which the teacher works—on questions that deal with educational matters at hand opportunities of or to plan and implement changes in a particular teaching-learning context to improve practice and provide understanding for these stakeholders. Eileen (2000) points out the following about this type of research:

Action research specifically refers to a disciplined inquiry done by a teacher with the intent that the research will inform and change his or her practices in the future. This research is carried out within the context of the teacher's environment—that is, with the

students and at the school in which the teacher works—on questions that deal with educational matters at hand. (p.1)

This research design intends to discover which pronunciation errors at the segmental and supra-segmental level in the speech alter EFL learners' intelligibility at Colombian learners of English at Universidad Pedagógica y Tecnológica, Sogamoso headquarter. The present research also plans, acts, observes and reflects on the learning and game factors that affect Colombian university students' learning toward integrating game thinking elements into English pronunciation instruction.

Research approach

The research approach has to be framed in the descriptive method to evaluate some characteristics of a population or a particular situation, those related to English pronunciation and gamification. According to Ander-Egg (1995), describing implies systematically observing the object of study and cataloging the information observed to be used and replicated by others. Moreover, this method aims to obtain precise data that can be applied in averages and statistical calculations that reflect trends. Likewise, describing implies understanding the phenomenon under study from different perspectives, referring to the subjects involved.

From the author's reflections, this study must try to clarify the situations that affect the students' errors of English pronunciation, which is why it is necessary to describe the events of the educational reality.

Finally, the study's design is oriented from the comparative method, which allows reaching the fundamental constant of a social phenomenon, which in this case, are the English pronunciation skills. According to Sartori (1994), to compare is to confront one thing with

another, and compare involves assimilating and differentiating in the limits, so the advanced study seeks to compare two moments of research: the pre-test phase (before) and the post-test phase (after).

Context of the research

Population and sampling procedures

The population belongs to the UPTC, a Colombian public university with seven headquarters situated mainly throughout Boyacá. Currently, four headquarters can be seen on its official website: Tunja, Duitama, Chiquinquirá y Sogamoso with academic programs of undergraduate, distance learning, postgraduate and continuing education. This study's subject population is situated explicitly in the Sogamoso branch, where the primary attention professional and academic areas were initially concentrated in the mining, one of the most relevant sectors in Boyacá. With the Mining Engineering program creation by Resolution 033 of February 4, 1972, other programs arose, Industrial Engineering and Public Accounting (Agreement of June 4, 1974), Geological Engineering (Agreement 045 of 1979), Electronic Engineering (Agreement 048 of May 1992) and Business Administration, which began in the second half of 1995. Following the previous ones, Public Accounting, Industrial Engineering, Systems Engineering and Computer Science were created, followed by Finance and International Trade. Currently, the UPTC in Sogamoso offers eight undergraduate programs, nine specializations, four master's degrees and one doctorate. The population is mainly undergraduate students between sixteen and thirty years old, enrolled in engineering, technology and business programs. They are studying or have completed the six levels of the EFL course proposed as a degree requirement in their programs at the Universidad Pedagógica y Tecnológica de Colombia, Sogamoso headquarter.

A simple random sampling method was considered to select the participants under study. A sample of about thirty students was picked from students who attended the course call launched at UPTC Sogamoso's headquarter. The English pronunciation course tender allowed all eligible students to have the chance of being selected from the broad sampling setting. For this sample population's characterization, these students came from different educational backgrounds, especially English proficiency. For instance, the characterization survey considered gender, economic status, English knowledge, and age.

Researcher's impact

The presented study responds to the lack of strategies that address pronunciation teaching in a context where English language learning is outside the foreign language teaching programs, and therefore its curriculum is far from emphasizing phonetics and phonology. Hence, the most important consideration in this research is not only the key problem to be solved, but also all its possible effects: substitution of the sounds of Spanish as a native language for those of the English language (Hope, 2016), phonological fossilization of errors in the pronunciation of adult learners (Littlewood, 1984), very little phonetic knowledge (Hong and Yang, 2017), professional profiles are negatively affected when confronted with the labor market, and insecurity in communicative oral discourse in English (Akyol, 2013).

The use of gamification in virtual learning environments has been a successful methodology, especially in times of pandemic where virtual education was a tool that supported educational objectives at all educational levels in Colombia and worldwide. (Carrillo & Flores, 2020; Marchlik et al., 2021; Murphy, 2020; Ruiz Zamora, 2020).

On the other hand, the results of preliminary studies under this methodology are the first advances of the present research and “show a positive impact of gamification in lowering the students’ affective filter when learning English pronunciation” (Pérez-Cárdenas, 2021, p.60). Conclusively, the results obtained in the present research are part of future research on the EFL acquisition improvement process and the language's intelligibility and following methods to address the teaching-learning of pronunciation process.

Ethical Protocol

This educational research was framed by a sequence of ethical implications related to the methodology, theoretical framework, and study purposes. These considerations are initially based on the statutes and institutional research guidelines of the entities related to this proposal: “Universidad Nacional Abierta y a Distancia” (UNAD) as the educational entity in which the study is presented; and “Universidad Pedagógica y Tecnológica de Colombia” (Comunicado del 27 de Junio del 2014 de Vicerrectoria Académica, Dirección de Investigaciones y comité de Ética para la Investigación Científica, UPTC), context in which the research was carried out. Resolution 8430, 1993 in chapter 3 refers to the institutions' internal policies and the elaboration of their internal procedures manual to support the application of these norms.

This section aims to consider the scientific dimension and ethical and regulatory dimension of this research, respecting human dignity, protecting the environment, and describing the moral conditions that ensure better execution of the proposal's objectives. A true scientist's moral conditions include personal disinterest, intellectual honesty, and determination to search for truth.

The research development includes national and international regulations that refer to ethical considerations and the direct or indirect impact on humans, non-humans, and the environment (Resolución 008430 de 1993; Helsinki declaration, 2013; International Ethical Guidelines for Biomedical Research Involving Human Subjects, CIOMS, 2002; the framework for Research Ethics FRE, 2010). In addition, the protocols of the present investigation consider the normative axes of protection described below.

Classification and minimization of research risk. According to “Resolución 008430 de 1993, Artículo 11”, the present research is classified in the “Research without risk” category because this study uses retrospective documentary research techniques and methods. The study does not perform any biological, physiological, psychological, or social intervention or intentional alteration of the study's participation. Besides, no physical, psychological, cultural, economic, or other risks specific to the research's execution and after its completion are involved.

Confidentiality, confidentiality, privacy, and identity protection. Precautions were taken to protect the participants' rights to privacy, information, and the confidentiality of their personal data as defined by the Constitutional Court of Colombia. Participants can leave the research, and their well-being monitored. Their constitutional rights to know, delete, update and rectify all types of personal data collected, stored, or processed have been proposed in this research (Artículo 8° de la Ley 1581 de 2012 / Decreto 1377 de 2013). No image or recording will be published without the prior participants' authorization. This matter's study requires considering individuals' images as personal data (Ley 1581 de 2012).

Data treatment. The minimum requirements for a personal data policy are regulated in “Artículo 13, Decreto Reglamentario 1377”. On the other hand, the Regulatory Decree defines, in its article 3°, the concepts necessary to determine the object of the image use license contract

under the parameters of the Habeas Data legislation. Data treatment is the transfer of data, which occurs when the responsible researcher sends information or personal data to a national or international recipient who is the data controller, and the transmission of data is interpreted as data communication. This data treatment process is developed under the methodological research execution described in this proposal (see [Appendix C](#)). The reports requested by the entities to which this project is subscribed and the products from this study.

Consent Form. The participation of persons capable of giving informed consent in medical research should be voluntary. Although it is consulted with family members or community leaders, no person capable of giving informed consent should be included in a study unless they freely agree to do so (Helsinki, 2013). The formats are attached to this paper in English ([Appendix D](#)) and Spanish ([Appendix E](#)) versions with the revocation of the consent letter.

Researcher commitment. As the present project researcher, I declare that I have the ideal characteristics to execute it at the level of experience in academic and research training processes. I also declare my commitment to carry out the activities included in the chronogram of the proposal to achieve the expected results within the framework of the ethical criteria established by the institutions involved. The reserve and confidentiality of the information, environment protection, and conflicts of interest were prioritized during the research process described herein. Once the present research was completed, the participants were informed about the final information treatment, and the results are the basis for the consolidation of new knowledge products.

Interest conflicts. As mentioned previously, the institutions related to this proposal are Universidad Nacional Abierta y a Distancia (UNAD) and Universidad Pedagógica y Tecnológica

de Colombia (UPTC)]. No conflict of interest for copyrights or publications is generated with the research development, taking into account the process of linking the guide's products to recognize and measure research groups and researchers.

Environmental protection. The development of this research proposal does not pose any risk to the environment.

Data collection techniques

Description and rationale of the instruments

These seven instruments led to analyzing the results qualitatively and quantitatively to produce meaningful results and conclusions for this study. Some instruments were used in this proposal for the data collection, described as follows.

Characterization survey.

Goal. To find out target population characteristics, their perceptions about their English learning process, and their expectations for using games in the pronunciation course.

Description. The characterization survey has fifteen (15) items; six (6) items focused on personal information, name, ID, gender, age, academic program, and semester; two (2) questions oriented to students' background with virtual and pronunciation courses; four (4) oriented to the students' perceptions about gamification and English pronunciation, in this part, each item is followed by a scale that has a label on each side, and the numbers 1-7 between the two extremes. The last items require a Placement Test score based on the CEFR scale and the pdf results from the Berlitz Online Placement Test ([See Appendix A](#))

Rational. This characterization questionnaire is essential to identify the characteristics of the sample to be worked on in this study, to determine initial general factors of the target population that should be considered and contrasted with the study variables and other elements that may arise during the observation.

Type of Data Collection. Quantitative data

Diagnostic Pronunciation Test or Perception of the Spoken English (POSE) Test

Goal. To determine specific students' pronunciation errors at the segmental and suprasegmental levels through the POSE test. "The Perception of Spoken English Test diagnoses learners' specific speech perception problems, alerting teachers to areas that require special attention in a particular course or lesson" (Shewell, 2004, p.3).

Description. "The Perception of Spoken English (POSE) Test is a computer-based test that focuses on diagnosing problems in the perception of vowels, consonants, word stress, intonation, and sentence stress." (Shewell, 2004, p.35). Table 2 shows a detailed description of each POSE test section.

Rational. The POSE test incorporates many items for each aspect of speech perception included in the test. Second, the POSE test is computer-based, requiring less teacher time and resources and allowing more people to utilize the POSE test differently. Finally, the POSE test includes both segmental and suprasegmental aspects of speech perception, providing teachers and apprentices with a more accurate speech problem profile.

Type of Data Collection. Quantitative data.

Table 2*POSE Test description*

Section /Features	No. Items	Diagnose problems		
Vowel section (Segmental features)	Thirty-eight (38) items	Eleven (11) vowel consonants:		
		/ɪ/ - /I/	beet / bit	4
		/I/ - /ɛ/	bit / bet	4
		/ɛ/ - /e/	bet / bait	4
		/ɛ/ - /æ/	bet / bat	4
		/æ/ - /ɑ/	cat / cot	4
		/ɑ/ - /ɑr/	cot / cart	4
		/ɑ/ - /ə/	cot / cut	4
		/ɑ/ - /ow/	cot / coat	4
		/ə/ - /ɚ/	cut / curt	2
		/ə/ - /ʊ/	putt / put	2
		/ʊ/ - /uw/	pull / pool	2
Consonant section (Segmental features)	Eighty-four (84) items	Twenty (25) consonant contrasts		
		/p/ - /b/ _(INIT.)	pill / bill	4
		/p/ - /b/ _(FIN.)	cap / cab	4
		/p/ - /f/ _(INIT.)	pan / fan	4
		/p/ - /f/ _(FIN.)	cup / cuff	4
		/v/ - /b/ _(INIT.)	vote / boat	4
		/v/ - /w/ _(INIT.)	vet / wet	4
		/f/ - /v/ _(INIT.)	fan / van	4
		/f/ - /θ/ _(INIT.)	free / three	4
		/θ/ - /t/ _(INIT.)	thin / tin	4
		/θ/ - /t/ _(FIN.)	bath / bat	4
		/θ/ - /s/ _(INIT.)	think / sink	2

		/θ/ - /s/ _(FIN.)	faith / face	2
		/ð/ - /d/ _(INIT.)	they / day	2
		/t/ - /d/ _(FIN.)	cart / card	4
		/n/ - /l/ _(INIT.)	nap / lap	4
		/n/ - /l/ _(FIN.)	bone / bowl	4
		/l/ - /r/ _(INIT.)	lice / rice	4
		/s/ - /z/ _(FIN.)	ice / eyes	4
		/s/ - /ʃ/ _(INIT.)	sip / ship	2
		/ʃ/ - /tʃ/ _(INIT.)	shin / chin	2
		/ʃ/ - /tʃ/ _(FIN.)	wash / watch	2
		/tʃ/ - /dʒ/ _(INIT.)	choke / joke	2
		/dʒ/ - /y/ _(INIT.)	jail / Yale	2
		/k/ - /g/ _(INIT.)	coat / goat	4
		/k/ - /g/ _(FIN.)	tack / tag	4
Word Stress Section (Suprasegmental features)	Forty (40) items or words	Two (2) to five (5) syllables each.		
Intonation Section (Suprasegmental features)	Forty (40) items. Two different types of items.	<ol style="list-style-type: none"> 1. The first twenty (20) items are questions or statements. 2. The last twenty (20) items consist of sentences that end in tag questions 		
Sentence Stress Section (Suprasegmental features)	Two parts.	1st part (stressed word in a sentence). A set of minimal pair sentences. 2 nd part (thought groups). Twenty minimal pair sentences.		

Note. Segmental and Suprasegmental POSE features. Own authorship.

EFL Students' questionnaire.

Goal. To frame game factors and factors affecting English pronunciation learning.

Rational. The EFL learners' questionnaire focuses on some self-perception aspects of the game elements interactions and the course implementation and their relevance for English

pronunciation improvement. The categories selected for this questionnaire were the most relevant in the initial qualitative results. The main game factors were game goals, challenge, sensation, sociality (Shi & Shih, 2015). These factors were selected according to the game typology applied in the course and emerged as the most important qualitative analysis. The main factors affecting pronunciation considered in this questionnaire were: attitude, motivation, instruction, and exposure to the target language, as seen in Table 3.

Table 3

Game and English Pronunciation factors

Game Factors	Pronunciation Factors
Challenge	Attitude
Game goals	Instruction
Sociality	Motivation
Sensation	Exposure

Note. Main factors understudy in the students' questionnaire. Own authorship.

Description. The questionnaire was based on Shi & Shi's model (2015) and used a 5-point Likert scale. For example, 1 suggests strongly disagree, and 5 strongly agree for each one of the criteria. The questionnaire was used to analyze the factor design for games designed at Genially, Kahoot, Quizizz, Bamboozle, Tinytap, Nearpod, H5P, and Jeopardylabs.

The students' questionnaire has 14 items; the first three are oriented to the games' goals and their correlation with the English pronunciation instructional process. Items 4, 5, and 6 are oriented to define the challenge factor in games and learners' attitude towards them as mediators of their learning in pronunciation. Items 7, 8, and 9 focus on sensations and their effect on

learners' motivation. Items 10, 11, and 12 seek to identify if sociality and a factor promoted participants' exposure to the target language. Finally, questions 13 and 14 define the participants' conformity and aim to know their perception and expectations of the gamification elements proposed in the course ([See Appendix B](#)).

Type of Data Collection. Quantitative and qualitative data

The field notes.

Goal. To integrate game elements into English pronunciation instruction that meet undergrads' pronunciation needs.

Rational. Hernandez Sampieri (2010, p.377) states that the notes taken must describe what the researcher observes, listen, smell, and touch. These sense perceptions are what direct observation offers when using field notes in research. Thus, the field notes must be read every time, and the written information should include the researcher's own words, feelings, and behavior. Likewise, Cerda (1991, p.237) points out that the observer must pay close attention to an aim in which they have an exact conscious and thorough position towards that object of observation.

Description. The field notes are instruments that let the researcher take some records, observe the students' behavior towards the pronunciation features, notice the internal and external factors that may affect the procedures, take notes of actions, ideas, thoughts, and eventualities in the study. All the e-sessions or synchronous meetings were recorded to have a second chance to review students' interactions and behaviors toward the proposed game activities.

Type of Data Collection. Qualitative data.

The post-test.

Goal. To specify whether there are meaningful improvements in English pronunciation's specific features when integrating Gamification as an e-learning-teaching strategy.

Rational. At the end of the course, participants take a post-test to assess their progress. The pre-test and post-test designs are established to assess the needs of segmental and suprasegmental features and determine the sample population's changes.

The post-test is an instrument that may lead the researcher to decide when finishing the study, come to conclusions, and take the data needed to observe how the interventions are after the analysis obtained in the pre-test.

Description. “The Perception of Spoken English (POSE) Test is a computer-based test that focuses on diagnosing problems in the perception of vowels, consonants, word stress, intonation, and sentence stress.” (Shewell, 2004, p.35). Table 1 shows a detailed description of each POSE test section.

Type of Data Collection. Quantitative data.

Validation Procedures

Content validity. Initially, a single survey was designed to characterize the target population and determine the population's perceptions of game factors and factors affecting pronunciation learning. This first design was implemented in a later group in 2020. This first survey determined the participants' age and gender and explored game factors such as challenge, sensation, and achievement. Some factors affecting pronunciation, such as motivation, attitude, and instruction, were also studied in this first survey. This first survey version can be reviewed at

<https://forms.gle/m21XzpvtKgYE2PRF9>. The pilot results can be seen in Appendix A. (The survey validation is also done by getting opinions and suggestions from the research tutor)

The POSE test has already been validated with the Shewell (2004) research process, and free access is available for a minimum of thirty days for its software implementation.

Criterion validity. After the pilot results, two sorts of surveys were designed: the first focused on obtaining participants' descriptive characteristics as EFL learners and the second on the game factors and those that affect English pronunciation. Table 2 shows the criteria to be measured in the students' survey.

Construction validity. All the instruments, the POSE test, characterization survey, game, pronunciation learning factors survey, and the Trello field diaries, are aimed at the objectives planted in the proposal. They describe characteristics and measure the variables proposed in the research project as referenced in each instrument's description in this paper and the theoretical framework.

Pedagogical Intervention

The pedagogical intervention was designed under e-learning (electronic learning), allowing a training system whose main characteristic is carried out through the Internet or connected to the network.

Pedagogical Method

The pedagogical method combines “the reform movement” (Rojas & Serrano, 2013, p.16) and “new directions in teaching and learning English pronunciation” mentioned by Hismanoglu & Hismanoglu (2010 p.985). The first model refers to how speaking skills must be

taught and applying phonetics to language teaching. Thus, teachers have well-founded phonetics knowledge that helps learners develop good speech habits.

Given the prevalence of communicational encounters worldwide in which at least one participant is an L2 speaker and the potential for communication breakdown and misunderstanding based on both segmental and suprasegmental aspects of pronunciation, there is an obvious role for language teachers, and pronunciation teachers in particular, to work on not only speaker behaviour but also listener behaviour to ensure mutual understanding (Pennington, 2021, p.18).

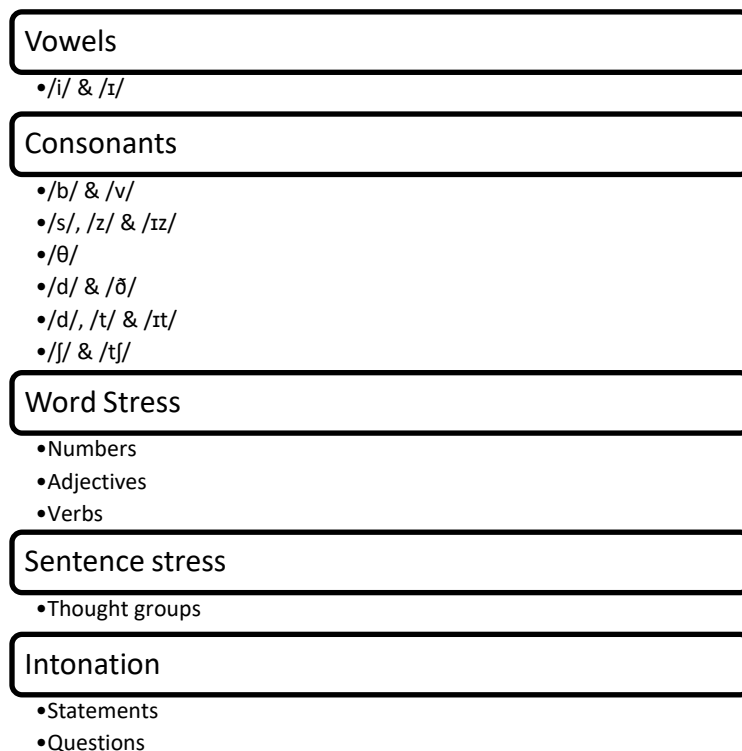
The second model, also called “Integrated whole-body Approach” by Rojas & Serrano (2013, p.15) and first suggested by Celce- Murcia (2001), emphasizes the technological elements use in teaching English pronunciation. Finally, Pennington (2021) refers to “two contributions (Henrichsen; Rogerson-Revell) that emphasize the considerable utility of many different types of technological resources and the still unrealized potentials of the technologies for pronunciation” (p.12).

Moodle Pronunciation Course

A course at the Institutional Moodle Platform was created and designed to propose the theoretical and pragmatic pronunciation content, organize the activities, and integrate the game elements focused on the participants’ pronunciation needs and verified with the POSE test results. The course has sixteen weeks last and all the content is organized into this weekly period. The game activities were divided into ten challenges with selected pronunciation-based activities over the participants’ segmental and suprasegmental needs. Delimited online and digital game sources are considered during these interventions aforementioned in the next item.

Most of the game elements were taken, adjusted, and designed at Genially, Kahoot, Quizizz, Bamboozle, Tinytap, Nearpod, H5P, and Jeopardylabs ([See Appendix G](#)).

Challenges as content units. The virtual course at Moodle platform was designed taking into account the main participant group's pronunciation issues detected in the diagnostic POSE test. Each unit or challenge had three parts: Watch the video, let's prepare, and let's play. "Watch the video" was the instruction for modeling the sounds stress through easy articulation tips. The videos are mainly resources taken from BBC Learning English (British pronunciation) and Elemental English (American pronunciation); these media resources taught participants how to articulate and produce the problem English sounds. "Let's prepare" activities are practice exercises created with H5P and Moodle tools to have some practice before the arranged synchronous meeting. Finally, the "Let's play" section integrates game sources as elements that can be taken synchronously and asynchronously. Therefore, participants could play games oriented to the content challenge and then have an e-meeting where these games were played live in individual, team, and competition modalities. Figure 6 shows the contents integrated into the virtual course challenges.

Figure 6*Challenges pronunciation content*

Note. The topics were designed and integrated according to the POSE diagnostic test results (Shewell, 2004). The main features diagnosticated were Vowels, Consonants, Word Stress, sentence Stress, and Intonation, which were considered to create the virtual academic English course.

Synchronous meetings

The second part of the pedagogical application was conducted as synchronous weekly sessions by Google Meet. There were about sixteen practical sessions where participants had the opportunity to clarify their concerns about the contents and activities proposed in the virtual course. In addition, modeling and easy basic articulation tips were given during these meetings before going to live games as oral practice and pronunciation awareness.

Data Analysis and Findings

This chapter presents the results of the research development related to gaming factors and their impact on the main factors influencing English pronunciation learning. Their effect on learning before and after the training process was through the didactic use of synchronous game elements (meetings through Google meet) and asynchronous (instructional and gamified activities in the Moodle platform). Qualitative results also dealt with student participants' observations and opinions on the gamification strategy.

Data management procedures

This study established a results analysis plan based on the proposed objectives, descriptive and inferential statistics were used. Descriptive statistics are a set of procedures that aim to present data groups through tables, graphs, and summary measures or categories and subcategories in qualitative studies.

According to the above, descriptive statistics is the first stage of analyzing information. For this study, descriptive statistics are based on interpreting the categories and subcategories emerging from the characterization survey and the diagnostic Pronunciation Test or Perception of the Spoken English (POSE) Test applied to the participating students.

Once the descriptive statistics are established, inferential statistics and probabilistic language allow predictions and conclusions. Based on the population characteristics and the information extracted from the sample, the strategic elements to be applied were determined. The instruments that were used to collect the information were qualitative and quantitative.

Qualitative instruments.

Diagnostic test: It was used in the diagnostic phase to determine how students use communication channels, especially social networks.

Opinion survey: It was used in the reflection phase to interpret the opinions and experiences of the study participants.

The post-test. It was used to make decisions when finishing the study, conclude and take the data needed to observe the interventions after the analysis obtained in the pre-test phase.

Qualitative instruments

Field Diaries: In this study, field diaries' purpose was to keep systematic records on the events of the research process, based on the appreciations, opinions, and reflections of the subjects under study.

Sample understudy characterization

The Characterization survey was the first instrument to determine the target population characteristics, their perceptions about their English learning process, and their expectations for using games in the pronunciation course. This characterization questionnaire was essential to identify the characteristics of the sample to be worked on in this study, to determine initial general factors of the target population that should be considered and contrasted with the study variables and other elements that may arise during the observation. Therefore, the analysis described below is quantitative. Table 4 describes the main characteristics of the student population, considering them important to outline the population's identity.

Table 4*Sociodemographic characteristics of the sample under study*

Criteria		Percentage Distribution
Gender	Male	56.3 %
	Female	43.8%
Average age	20-30 years old	75 %
	18-20 years old	25 %
Academic program	Geological Engineering	25 %
	Mining Engineering	12.5 %
	Electronic Engineering	12.5 %
	Finance and International Trade	12.5 %
	Industrial Engineering	12.5 %
	Systems and Computer Engineering	12.5 %
	Agricultural Manager	6.3 %
	Business Administration	6.3 %
	1st to 3rd	37.5 %
	4th to 6th	25%
	7th to 10th	37.5 %
English proficiency according to the Common European Framework (CEFR)	A1	31.3 %
	A2	62.5%
	B1	6.3%
Economic Status	I	30 %
	II	45%
	III	15%
Access level to ICT	Good: Most students have mobile devices laptops; also, the educational institution has the necessary system infrastructure or Learning system environment (LSE). Moodle Platform	

Note. Specific characteristics found in the study population partially determine the student's profile interest in improving English pronunciation. Mostly male students (56%), 20-30 aged, A2 according to CEFR. Own authorship.

Higher participation in the course of the male gender is evidenced with 56.3 % compared to the female gender with 43.8%, indicating the constant preference of the male gender for the

course offered. The results of the age variable show in detail that 25% of the participants are between 18 and 20 years old, and 75% are between 20 and 30 years old.

The program that shows the most interest in improving their English pronunciation through games is Geological Engineering with 25%, followed by Mining Engineering, Electronic Engineering, Finance, and International Trade and Industrial Engineering with 12% each. The percentages with the least influence of participants are Agricultural Manager and Business Administration with 6.3%. Most of the students who participated are between the first and third semesters with 37.5 %; fourth and sixth semester, 25% and seventh to tenth semester, 37.5 %.

Most of the participants who attended the course have A2 proficiency English Level with 62.5 %, followed by 31.3 % who have A1 and a minimum average of 6.3 % with B1. Students with A2 level are more interested in improving their English pronunciation.

Students' background with virtual and pronunciation courses. Regarding the question "Have you taken distance courses? The student population answered No (56.3%) and Yes (43.8%), allowing us to visualize the level of experience with technological tools and strategies in their learning process. See Table 5.

Table 5*Students' background with virtual and pronunciation courses*

Criterion	Yes	No	Total
Participants' experience with e-learning courses			30
	43.8%	56.3%	100%
First time taking an English pronunciation course			30
	93.3%	6.6%	100%

Note. Most students do not have experience in distance learning courses, probably because they belong to face-to-face programs. Therefore, most of the participants have no experience with English pronunciation instruction. Own authorship.

Another fundamental factor determined in this section of the analysis of the participants' characterization is that most have very little experience with English pronunciation courses. Only 6.3% of the totality have taken courses focused on English Pronunciation, while 92.8% deny having any experience with English Pronunciation courses.

Students' perceptions about Gamification and English pronunciation. The analysis of the following items measures participants' initial attitudes and perceptions about learning English pronunciation and strategies such as gamification. The purpose is to relate these partial results to those obtained after applying the experience in the student survey.

A scale followed each item in the questions, and the numbers 1-7 between the two extremes. Most students reported having a very high interest in learning English pronunciation, with 68.8 % on a scale of 7. Twenty-five percent show between one and two points lower on the interest scale, while only 6.3% report low interest in learning pronunciation, as seen in Table 6.

Table 6

Students' initial perceptions on learning pronunciation through gamification

Criteria	N	Mean	Variance
My interest in learning English pronunciation is	30	6.3125	1.829
I think games are useful elements to improve my English pronunciation skills	30	6.3125	0,495
My motivation to learn English pronunciation for practical purposes (e.g., getting a job and traveling abroad) is	30	6.4375	0.529
Studying English Pronunciation can be important for me because I will be able to interact with native English speakers	30	6.5	0.5

Note. Participants stated that they are highly interested in improving their English pronunciation. The vast majority of students show sympathy towards games as learning tools. Participants have strong reasons for their experiential language practice to improve their English pronunciation. English native speaker interaction is a motivation factor to learn English pronunciation. Own authorship.

Table 6 shows that 43.8 % of the students strongly agree that games are useful elements to improve English pronunciation, another 43.8 % indicated in a range of 6 positions strongly agree, and 12.5 % agree. Therefore, the vast majority of students show sympathy towards games as a learning tool. Also, students reported having strong practical motivations to improve their pronunciation, with 53.3% in the highest range (7), 31.3% in the range below (6), and 12.5% with a little more weakness in their response (5). Therefore, there are reasons in their experiential language practice that motivate students to improve their English pronunciation. Considering the notion of relationships with native speakers, the participants (62.5%) strongly

agree with the need to improve their pronunciation to interact with native speakers of the English language. 31.3% strongly agree on scale 6, and 6.3% agree on scale 4.

Diagnostic Test: Perception of the Spoken English (POSE)

The POSE test determined specific students' pronunciation errors at the segmental and suprasegmental levels. The diagnostic test provided guidance to the researcher on the segmental and suprasegmental characteristics to be worked on. The instruction and gamified activities followed the parameters indicated in the lower POSE test results.

Segmental speech perception results. According to the guidance given by the author (Shewell, 2004), the vowel contrasts section results show the total number of items and the items percentage the student scores correctly in each contrast. If the score for a specific contrast is 75% or higher, the student usually has no problems with that contrast. For most contrasts, there are only 2 or 4 items per contrast. Therefore, if a student scores 50% on contrast with only two items, further diagnosis may be necessary to determine if that particular contrast is a problem for that student. Comparing the scores on each contrast across all the participants give the researcher a better idea of which contrasts to focus on (/i/ - /ɪ/, /ɪ/ - /ɛ/, /ɛ/ - /æ/, /ɑ/ - /ow/) as shown in Table 7.

Table 7*Vowel results POSE Test*

Vowel sounds	Number of items	Results
/i/ - /ɪ/	(4 items)	25%
/ɪ/ - /ɛ/	(4 items)	25%
/ɛ/ - /e/	(4 items)	50%
/ɛ/ - /œ/	(4 items)	25%
/œ/ - /ɑ/	(4 items)	50%
/ɑ/ - /ɑr/	(4 items)	50%
/ɑ/ - /ə/	(4 items)	50%
/ɑ/ - /ow/	(4 items)	25%
/ə/ - /ə̃/	(2 items)	50%
/ə̃/ - /ʊ/	(2 items)	50%
/ʊ/ - /uw/	(2 items)	50%
Overall Score:		30%

Note. Participants' segmental POSE results showed low scores on the use of /ɪ /, /ɪ/, /ɛ/, /œ/ , /ɑ/, /ow/sounds. Own authorship.

POSE lists the contrasts in the consonant section and the total number of items and the percentage of items the student got right for that contrast. Some contrasts are initial syllabic, while others are final syllabic. This is noted next to the contrast in the results. If the score for a specific contrast is 75% or higher, the student usually has no problems with that contrast. In most contrasts, there are only 2 or 4 items per contrast. Therefore, if a student scores 50% on contrast with only 2 items, further diagnosis may be necessary to determine if that particular contrast is a problem for that student. Table 8 shows participants' problems on /ð/ - /d/ (initial), /s/ - /z/ (final), /t/ - /d/ (final), /θ/ - /t/ (final), /θ/ - /t/ (initial), and /v/ - /b/ (initial).

Table 8*Consonant POSE Test Results*

Consonants sounds	Number of items	Results
/p/ - /b/ (initial)	(4 items)	75%
/p/ - /b/ (final)	(4 items)	75%
/p/ - /f/ (initial)	(4 items)	100%
/p/ - /f/ (final)	(4 items)	75%
/v/ - /b/ (initial)	(4 items)	25%
/v/ - /w/ (initial)	(4 items)	100%
/f/ - /v/ (initial)	(4 items)	50%
/θ/ - /θ/ (initial)	(4 items)	75%
/θ/ - /t/ (initial)	(4 items)	25%
/θ/ - /t/ (final)	(4 items)	0%
/θ/ - /s/ (initial)	(2 items)	25%
/θ/ - /s/ (final)	(2 items)	75%
/ð/ - /d/ (initial)	(2 items)	0%
/t/ - /d/ (final)	(4 items)	25%
/n/ - /l/ (initial)	(4 items)	100%
/n/ - /l/ (final)	(4 items)	100%
/l/ - /r/ (initial)	(4 items)	75%
/s/ - /z/ (final)	(4 items)	25%
/s/ - /ʃ/ (initial)	(2 items)	75%
/ʃ/ - /tʃ/ (initial)	(2 items)	50%
/ʃ/ - /tʃ/ (final)	(2 items)	25%
/tʃ/ - /dʒ/ (initial)	(2 items)	50%
/dʒ/ - /y/ (initial)	(2 items)	50%
/k/ - /g/ (initial)	(4 items)	100%
/k/ - /g/ (final)	(4 items)	50%
Overall Score:		69%

Note. Participants' segmental POSE results showed low scores on the use /θ/ - /t/ (final), /v/ - /b/ (initial), /θ/ - /t/ (initial), /s/ - /z/ (final) sounds. Own authorship.

Suprasegmental speech perception results. This section is limited to the total number of items and the percentage of items the student scored correctly for that pattern. If the score for a specific pattern is 75% or higher, the student generally has no problems with that pattern.

Comparing the scores for each contrast across all students in the sample gives the researcher a

better idea of which stress patterns to focus on in practical activities (2 syllables, stress on 1st, 5 syllables, stress on 3rd, 5 syllables, stress on 4th) as shown in Table 9.

Table 9

Word Stress results POSE Test

Word Stress	Number of items	Results
2 syllables, stress on 1st	(5 items)	40%
2 syllables, stress on 2nd	(5 items)	80%
3 syllables, stress on 1st	(10 items)	90%
4 syllables, stress on 2nd	(8 items)	88%
4 syllables, stress on 3rd	(2 items)	100%
5 syllables, stress on 2nd	(4 items)	100%
5 syllables, stress on 3rd	(4 items)	50%
5 syllables, stress on 4th	(2 items)	75%
Overall Score:		80%
Intonation 1		
Rising (Question)	(10 items)	50%
Falling (Statement)	(10 items)	60%
Overall Score:		60%
Intonation 2		
Rising (Asking)	(10 items)	50%
Falling (Comment)	(10 items)	50%
Overall Score		25%

Note. Participants' segmental POSE results showed low scores on two syllables, stress on 1st. Own authorship.

The intonation section of the test focused on the perception of rising and falling intonation at the end of a sentence, specifically focusing on the distinction between questions and statements (Intonation 1) and the use of etiquette questions to seek information or make comments (Intonation 2). The results page showed the overall score for items with increasing intonation and decreasing intonation and indicated whether the test focused on questions/statements or tag questions. Comparison of the scores across all participants' scores

pointed to the intonation two patterns to focus on in the instructional and gamified activities, as seen in Table 10.

Table 10

Intonation results POSE Test

Feature	Number of ítems	Results
	Intonation 1	
Rising (Question)	(10 ítems)	50%
Falling (Statement)	(10 ítems)	60%
Overall Score		60%
	Intonation 2	
Rising (Asking)	(10 ítems)	50%
Falling (Comment)	(10 ítems)	50%
Overall Score		25%

Note. Participants' segmental POSE results showed low Rising (Asking) and Falling (Comment) intonation scores. Own authorship.

Categories

The categories related in this study are deductive since they were established based on the theory and the researcher's knowledge, serving as essential clues in the organization of the studied reality approach (Monje Álvarez, 2011). Atlas. Ti version 9.0 was used to process the field notes and open questions conducted to the students, thus determining the most important factors affecting their English pronunciation learning process.

Discussion of categories

Factors affecting Participants' English pronunciation. During the implementation of the activities, some observations determined significant and preliminary factors related to Participants' English pronunciation.

Attitude. Participants showed a positive attitude toward learning English pronunciation using game elements. In addition, they indicated a favorable highest intensity of attitude in this category, leading to an integrative orientation to improve their intelligibility. The level of pleasure while actively participating in the activities proposed is another sample of positive attitudes toward this course implementation.

Motivation. Motivation indicators were observed since the intervention started, and the main results on this factor were sorted in extrinsic and intrinsic motivation and according to instrumental and integrative orientations. "Motivation is another affective category to consider, but one that is so central" (Brown, 2020, p.168).

Extrinsically motivation was found when the course started; it was a fundamental variable for students' learning pronunciation process; participants reacted positively to each session challenge cause of game activities sessions and from the first e-meeting. Certification for this course participation was mentioned and proposed with eighty percent of attendance and virtual course activities development as a requirement. Rewards from outside and beyond the self-anticipation fuel extrinsic motivation (Brown, 2007).

Gamification as a strategy involved interactive game elements that engaged students' extrinsic motivation. Each session had a game challenging participants' knowledge. All players

having or not the ability to solve the proposed tasks were easily involved because of the satisfaction of winning the game.

“Intrinsically motivated behaviors are aimed at bringing about certain internally rewarding consequences, namely, feelings of competence and self-determination” (Deci 1975, p. 23). Intrinsic motivation occurs when the player experiences a personal pleasure or satisfaction, for example, learning. Participants are self-conscious about improving their English pronunciation

Exposure. This category was observable in each of the activities developed. Participants had the opportunity to practice synchronous and asynchronous communicative activities determined by high exposure to the target language. “As far as the factor exposure to the target language is concerned, crucial differences in its impact on the adult learners’ pronunciation competence could be detected” (Richter, 2018 p. 353).

Instruction. The course on the Moodle platform had instruction in each pronunciation feature, with the highest error rate found in the diagnostic test. Participants had the opportunity to take these tutorials and instructional activities for four months. Each week an instructional and practical challenge was determined with synchronous and asynchronous game elements. However, the pronunciation instruction for these participants was poor or non-existent before the implementation phase. Considering the characterization test results, most participants stated that they had not received any English pronunciation instruction before the course. Only 6.6% of the participants responded that they had taken some English pronunciation courses, as seen in Table 5. Therefore, instructions were developed using easy articulation directions and meaningful modeling tips.

Teachers must have the responsibility to present the general rules and principles toward intelligible pronunciation to their EFL learners by teaching the new sounds, words, sentences, and phrases and arranging appropriate materials for learners to learn English pronunciation easily and effectively (Yürük, 2020, p.138)

Game Factors.

Game goals. The game elements integrated into the course were some designed, adapted, and others selected according to the objectives in each asynchronous challenge in the virtual course and weekly synchronous practice. The game goals included the teaching objectives and the experience they wanted to provide the players. According to Shi & Shih (2015), all factor designs should be based on game goals as the main notion.

Challenge. Challenge “refers to player efforts toward the game or personal goals”(Shi & Shih, 2015, p.3). The challenge in the application and observation phase was constant. The activities were challenge mechanisms such as tasks, rewards, and achievements. The observation in the synchronous meetings reported the challenge promotion to motivate the players to achieve their goals in each game stage.

Sensation. Sensation presents the virtual world to players, including audio and aesthetics”(Shi & Shih, 2015). The sensation experienced by the participants was another crucial factor detected throughout the course experimentation. In addition, audiovisual elements such as graphics, audio, and the games themselves contributed to understanding sounds and the participants' motivation and involvement.

Sociality. Social behavior within a game can be divided into communication, cooperation, competition, and conflict (Shi & Shih, 2015). Synchronous practical games through

Meet highlighted the socialization factor. Participants' interaction showed social satisfaction, especially in times of pandemics where competition and teamwork were features that fueled exposure to the English language and its articulatory practice.

Analysis of the Students' questionnaire

The survey was administered to thirty students involved in the implementation process from the beginning. Table 11 describes the frequencies found in each of the questions in the response categories.

Table 11

Students' questionnaire data analysis and results

	Subcategories	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree	Mean	Standard Deviation
1.	The games' goals were clear and easy to identify.	0	0	0	0	30	6	13,41
2.	The instructions about sound articulation were	0	0	0	6	24	6	10,39
3.	The instructions given on each pronunciation feature followed the goals set out in each game.	0	0	0	6	24	6	10,39
4.	The games were challenging.	0	0	0	8	22	6	9,59
5.	I could complete the challenges and finish the stages in the virtual course.	0	0	2	6	22	6	9,27
6.	Game challenges were favorable to master English pronunciation.	0	0	2	4	24	6	10,19
7.	Audiovisual elements made the games attractive to me.	0	0	0	6	24	6	10,39
8.	I enjoyed learning English pronunciation in this course.	0	0	0	2	28	6	12,32

9.	The sensations in each game stimulated my interest in mastering my English pronunciation.	0	0	0	8	28	7,2	12,13
10.	The games allowed me to cooperate or compete with others.	0	0	0	10	20	6	8,94
11.	Exposure to English during the course has made it easier to acquire good pronunciation	0	0	2	4	24	6	10,19
12.	Cooperation or competition contributes to experience and practice pronunciation.	0	0	2	4	24	6	10,19

Note. Own authorship

Each item is rated with the highest score; the rating in each aspect regarding game factors and factors influencing the learning of English pronunciation was positively perceived at the end of implementation. Therefore, subcategories were distributed as follows: questions 1, 4, 7, and 10 correspond to the game factors: game goals, challenge, sensation, and sociality, respectively, while questions 2, 5, 8, and 11 are directly correlated to instruction, attitude motivation, and exposure.

Hypothesis testing and operationalization of variables

Analysis of the Pre and Post Diagnostic Tests.

Tests of two related samples were performed to validate possible significant differences between the evaluation of the students' performance before and after the gamification intervention. When the variables scores present normal distribution, the "T- student" test is applied. Otherwise, a Wilcoxon semiparametric test is used (Wilcoxon, 1945).

Normality tests (Shapiro-Wilk) were performed on the scores obtained in the pre-and post-test to validate the assumptions of the difference of means in related samples. With a significance level of 5% ($\alpha=0.05$).

The statistical hypotheses are the following:

H0: *The variable (pronunciation features: vowels, consonants, stress, and intonation) has a normal distribution*

H1: *The variable (pronunciation feature: vowels, consonants, stress, and intonation) has a non-normal distribution*

Decision making:

If (p-value) > alpha: Do not reject H0 (normal).

If (p-value) < alpha: Reject H0 (non-normal).

Normality tests were performed on each score, as shown in Table 12, obtaining the following results.

Table 12

Pronunciation features scores

Feature	Pretest	Posttest
VOWELS, p-value	0.002499	0.002371
CONSONANTS, p-value	0.01658	0.0004631
Word Stress, p-value	0.08278	0.08308

Note. The p-value is less than 0.05 or 5%.in for most features except the Word stress variable. Own authorship.

Normality hypothesis is accepted only for the Word Stress variable, as scores demonstrated where p-value is greater than 0.005 (p-value > 0.05). A significance or error level of 5% or 0.05% was estimated. Therefore, the normality hypothesis is not accepted because the p-value is less than 0.05 or 5%.

Segmental Features. The vowels score presented abnormal distribution; thus, a Wilcoxon test was necessary to be applied.

Hypothesis

Ho: *The scores obtained in the VOWELS FEATURE in the pretest are equal to those obtained in the posttest.*

Ha: *The scores obtained in the VOWELS FEATURE in the pretest are different from those obtained in the posttest.*

Test statistics.

$$W = 4,$$

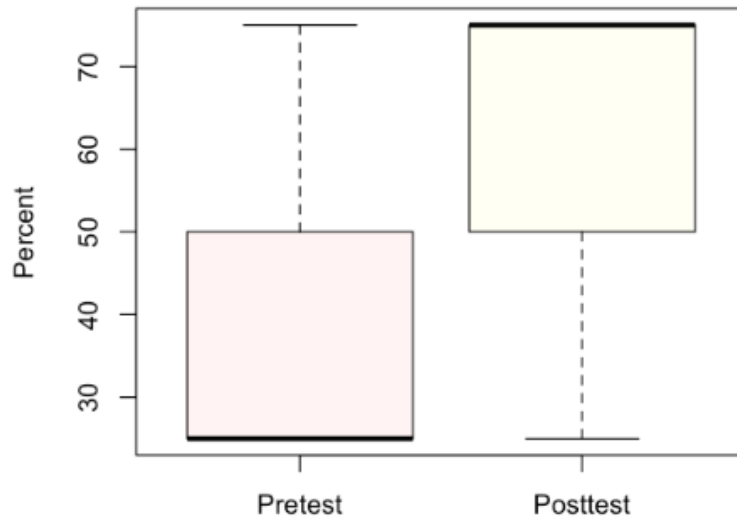
$$p\text{-value} = 0.02587$$

Decision: Ho is rejected since (p-value < α ; 0.02587 < 0.05).

With a significance level of 5%, there is sufficient statistical evidence to determine that the scores obtained in the VOWEL FEATURE in the pretest are different from those obtained in the posttest, as seen in Figure 7.

Figure 7

Box plot of data from vowels feature



Note. The variation of scores, the black line represents the median, half of the scores. Own authorship

Consonants

Hypothesis

H₀: *The scores obtained in the CONSONANTS FEATURE in the pretest are equal to those obtained in the posttest.*

H_a: *The scores obtained on the CONSONANTS FEATURE in the pretest are different from those obtained in the posttest.*

Test statistic

$$W = 208.5,$$

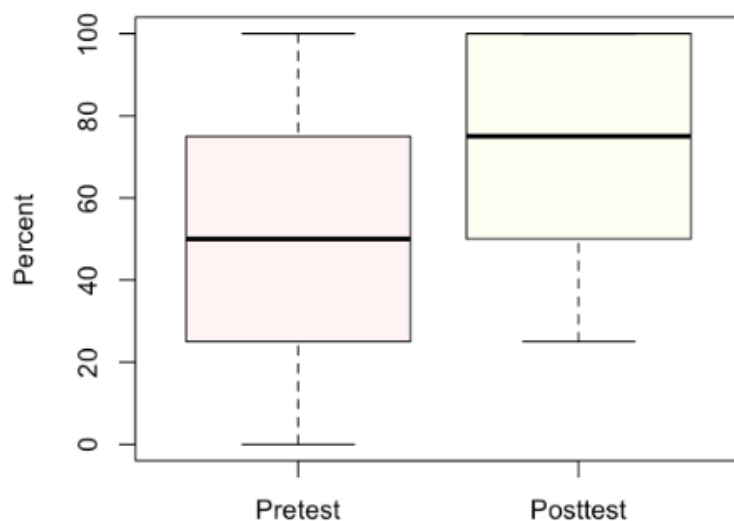
$$p\text{-value} = \mathbf{0.03744}$$

Decision: H_0 is rejected since (p -value $< \alpha$; $0.03744 < 0.05$).

With a significance level of 5%, there is sufficient statistical evidence to determine that the scores obtained in the CONSONANTS FEATURE in the pretest are different from those obtained in the posttest, as seen in Figure 8.

Figure 8

Box plot of data from consonants feature



Note. The variation of scores, the black line represents the median, half of the scores. Own authorship

Suprasegmental Features. Intonation and Sentence Stress. A normality test was not applied to this variable since the small amount of data in terms of performance percentages. Instead, the POSE results in the pretest and posttest were compared, as seen in Table 13.

Table 13*Intonation and sentence stress results*

	Pretest	Posttest
Intonation 1	75%	85%
	70%	80%
	80%	90%
Intonation 2	50%	65%
	50%	70
	50%	60
Sentence Stress 1	95%	95%
Sentence Stress 2	75%	95%

Note. Own authorship

In the case of the suprasegmental characteristics' intonation and sentence stress, the test percentages show an increase in the posttest concerning the pretest percentage.

Reliability and validity of analysis and findings

Qualitative information process

For the treatment of qualitative data, the program Atlas. Ti version 9.0, free version, Legewie (2014) was used. This program reduces the information until it finds the categories that are relevant to the study. Based on these approaches, software to process qualitative information allowed identifying emerging categories and subcategories to interpret the data collected. Furthermore, the software was used to process the field notes and open questions conducted to the students, thus determining the most important factors in their English pronunciation learning process.

Quantitative information Process

The quantitative data handling was done through Software R, which is a programming language especially indicated for statistical analysis. Unlike other computer programs with a window-shaped interface, R is handled through a console where language code is entered to obtain the desired results.

Robert Gentleman and Ross Ihaka initially designed r, members of the department of statistics at the University of Auckland in New Zealand; however, one of the great advantages of R is that today is the result of the efforts of thousands of people around the world who collaborate in its development.

On the other hand, R is considered the free version of another proprietary program, called S or S-Plus, developed by Bell Laboratories. Although the differences between R and S are important, most of the code written for S works in R without modifications. R is widely used in research because it calculates different measurements and statistical values, estimates and correlates information, and performs many other functions. For this study, the software was used to interpret the results of the dependent variable in the pre-test / post-test phase. Normality tests (Shapiro-Wilk) were performed on the pretest and post-test scores to validate assumptions of the difference of means in related samples. With a significance level of 5% ($\alpha=0.05$).

Discussions and Conclusions

The following chapter discusses and concludes by emphasizing the significance of the results obtained, the pedagogical and research implications, the limitations of the present study, and the recommendations for further studies. It also provides an answer to the research question: How do gaming factors in English as Foreign Language (EFL) mediation strengthen specific pronunciation features in UPTC Sogamoso undergraduate students?

The answer to the previous question was deductively directed, taking into account eight subcategories, four for the game factors category and four for the factors of the game related to Participants' English pronunciation. The general categories and subcategories emerged from the theory taken into account in this study and were subsequently outlined and described when analyzing the data obtained through ATLAS ti 9 in the implementation observations. On the other hand, a relation of the subcategories raised in the results of the questionnaire implemented to the students at the end of the implementation is presented, and highly positive results in the statistical analysis of the pre-test and post-test through T-student Wilcoxon semiparametric test with R software.

Significance of the results

The first stage results were strongly needed to characterize the study unit since the population was heterogeneous. Thus, it was necessary to determine its specific characteristics for integrating the game elements and the difficulty level in the synchronous and asynchronous activities such as Age, English proficiency level according to the CEFR, access to technological resources such as the Internet and computers, students' background with virtual and pronunciation courses, and students' perceptions about gamification and English pronunciation.

Since a large part of the study unit was A2 level according to the CEFR, the activities were adapted to fit A2 learning requirements.

Furthermore, knowing if the students had easy access to the internet and technological tools such as computers was required for the implementation stage, considering that the study population belonged to an institution of a face-to-face educational nature. Participants stated that they were highly interested in improving their English pronunciation in the perception questions. The majority of students (93%) showed sympathy towards games as a learning tool and strongly motivated their experiential language practice to improve their English pronunciation. In addition, English native speaker interaction was a motivation factor to learn English pronunciation. These initial insights were instrumental in guiding the design of the implementation phase.

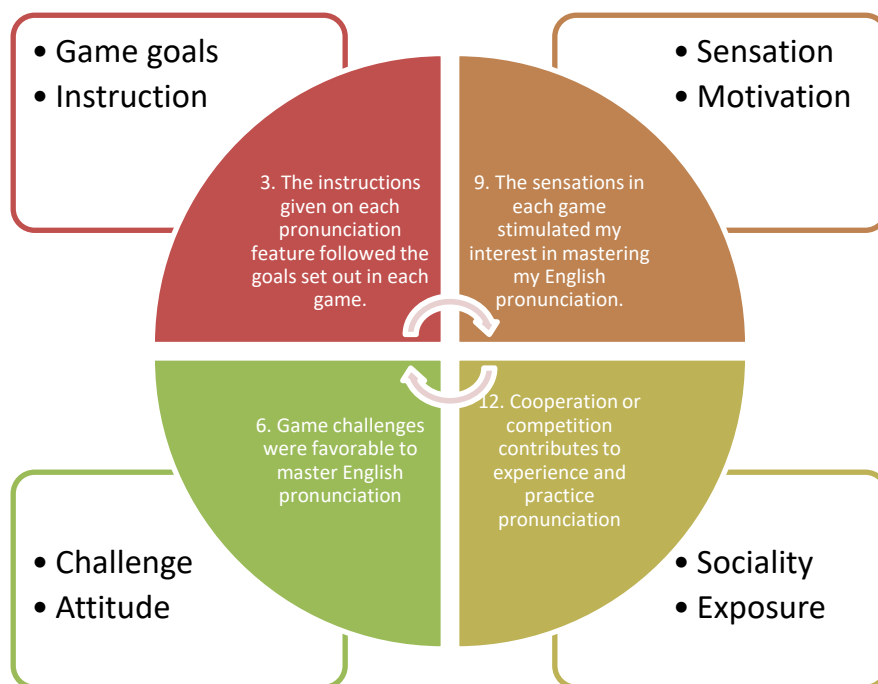
In the second stage of the study, the results obtained directed the specific contents to be addressed. The diagnostic test provided important information on the participants' most relevant segmental and suprasegmental pronunciation failures. (Burns, 2003). The results also framed synchronous and asynchronous activities that were real and meaningful since they tackled specific and homogenous group needs for the implementation stage.

In stage four, the results focused on the observations, the emerging subcategories of the game factors (Shi & Shih, 2015), and the factors affecting pronunciation learning (Pourhosein, 2012; see also Gilakjani, 2012; Tanner, 2012) were determined. Although the categories were initially determined deductively to focus the observation, the inductive method was then applied to filter the most relevant emerging subcategories: attitude, motivation, instruction, and exposure to the target language, game goal, challenge, sensation, and sociality.

In stage five, the questionnaire applied to students identified and reinforced the positive perception of each subcategory emerging from the observation as proposed. The questionnaire also fulfilled the purpose of establishing relationships between the two general categories: pronunciation and game factors; the design of complementary questions 3, 6, 9, and 12 ([Appendix H](#)) succeeded in establishing this relationship, as shown in Figure 9.

Figure 9

Game and pronunciation factors relation



Note. The participants' questionnaire results showed the relationship between the game factors established by Shi & Shih (2015) and the factors affecting pronunciation learning (Pourhosein, 2012).

Finally, stages six and seven of the present research are conclusive since the results aim to specify whether there are meaningful improvements in English pronunciation's specific features when integrating Gamification as an e-learning-teaching strategy. The statistical results

showed great relevance in the comparisons made between pretest and posttest. With reliability of 95%, there is sufficient statistical evidence to determine that the scores obtained in the suprasegmental features: vowels and consonants in the pretest are different from those obtained in the posttest, as seen in figures 7 and 8. Furthermore, in the case of suprasegmental features, it is observed in the posttest that the percentage increased concerning the percentage expressed in the pretest.

Pedagogical and research implications for the field of study

Gamification is not a new methodology in education or teaching English as a foreign language. This methodology emerged in the administrative and business field, and its implementation in teaching has been intensifying in the last few years. However, its integration into pronunciation teaching and learning, specifically in the English pronunciation practice, has been considered quite low since there are relatively few studies focused on the incorporation of pronunciation as a pedagogical instruction of sound production through the articulatory organs in the EFL context and, therefore, the inclusion of new methods or pedagogical strategies such as gamification to teach or practice pronunciation.

Furthermore, it is vital to consider the existing differences in the Game thinking approach discussed in Marczewski's (2010) studies where the concepts such as game-design inspiring, serious games, ludic, games, and play are far from being gamification. Instead, Gamification means bringing game elements to non-game situations to build pleasant, amusing, and motivating learning experiences (Werbach & Hunter, 2012). Consequently, games are specifically designed to improve pronunciation, such as mobile applications that do not involve gamification, whereas the game elements included in a pedagogical instruction are intended to gamify the experience.

The moodle platform offers a virtual environment that can be adjusted to the conditions of gamification; the different add ons or plug-ins offer a range of interaction, where the development of the proposed activities represent prizes, scores, and levels. It is also a fun experience that engages and connects participants to their asynchronous learning experience. Other game elements are currently very popular in teaching during the pandemic, such as Genially, Kahoot, Quizizz, Bamboozle, Tinytap, Nearpod, H5P, and Jeopardylabs.

Finally, the statistical analyses applied to the pretest and posttest tests confirm the level of learning obtained by the sample population with a reliability of 95% for the segmental characteristics. In the results of the suprasegmental characteristics, the scores in table 13 also showed gamification as a pedagogical strategy with a positive impact and learning meaningful improvements in English pronunciation's specific features.

Research limitations on the present study

When designing the action plan, thoughtful pedagogical questions emerged from the changing situation with the Emergency health caused by Covid-19. Sanitary policies took place worldwide, and Colombia was not the exception. As a result, most face-to-face context methodologies had to be switched to Virtual Learning Environments (VLEs) to support distance mediation.

Hence, EFL teachers had to deal with methodological changes, from face-to-face teaching to virtual metalinguistic incorporation. In addition, conducting the pedagogical mediation in the virtual environment of face-to-face undergraduate students requires specific knowledge on language and pedagogy and technology, innovation, and creativity skills. The continuous self-

training and the search for gamification strategies were time constraints. The researcher was unprepared to take on such technological strategies and required preparation and training time.

The proposed activities in this research are of two types, synchronous and asynchronous. The proposed asynchronous activities require time and autonomous work by the student before each synchronous meeting. The first ones are related to reading the information, reviewing video tutorials, listening and speaking practice, and recording. Other limitations were the noncompliance of the tasks or partial compliance due to the insufficient intrinsic motivation of the participants. Therefore, before starting the game practice, some time has been devoted to suprasegmental and segmental instruction and review to overcome these issues.

Teaching pronunciation appears to be a question. Stern states that the first question is how much attention should be attached to phonology, sound discrimination, and pronunciation teaching. He mentions that most methodologists admit that pronunciation is important in language teaching relative to other areas covered by the L2 curriculum. However, a few writers fear that too much importance has been attributed to pronunciation (1992).

Implementing the proposed action plan had important changes in my pedagogical praxis that positively affected the outstanding activities. First, the POSE test has been a fundamental tool for diagnosing the specific participants' needs to establish the gamification strategy game elements and pronunciation instruction. Second, active mediation was improved week by week in every meeting since the goal was to engage participants in their progress. As an amateur in mediating education, I have challenged appropriate technological and interactive game elements in a distant class. It is remarkable that this group of students also comes from face-to-face education methodologies that dares my pedagogical foundations on teaching English as a Foreign language. Third, extrinsically motivation is a crucial component in this process;

participants reacted positively to each session or challenge cause of game activities sessions and from the first e-meeting. Fourth, a certification completion was mentioned and proposed with an eighty percent of course participation as a requirement—rewards from outside and beyond the self-anticipation fuel extrinsic motivation (Brown, 2007).

Recommendations for further research

The results have been positive so far; students' participation and interaction inspire me to keep working on this process, while this course promises to be a creative and innovative opportunity to mediate the pronunciation of English as a foreign language. We cannot deny that phonetics is part of the Grammar-translation method, which some authors have criticized, e.g., “Henry Sweet argued that sound methodological principles should be based on scientific analysis of language and a study of physiology” (Arzamendy et al., nd, p.22). In our context, neither has been allowed to be better focused and mediated; many learners do not have the opportunity to acquire a clear pronunciation in a context like Colombia. They do not have the opportunity to get involved in immersions programs or contexts where English as a second language is taught, and pronunciation features training is left to chance or given no room. “Intelligible pronunciation is an essential component of communicative competence.” (Morley, 1991, p. 488).

This study represents Colombia's first steps on gamified English pronunciation instruction. It also allows EFL teachers at UPTC to understand students' attitudes and their sorts of motivation in this setting. Therefore, gamed thinking could be considered a positive change in learners' attitudes towards the target language learning. Teachers must employ suitable and effective mediation strategies to improve students' motivation and feel communicative confidence.

Conclusions

The second part of the results was gathered from the questionnaire applied to thirty students to measure their affective and social factors in learning pronunciation with game elements. Learners are highly motivated to improve their pronunciation features and intelligibility. Using games seems to be a good methodology to motivate and learn. It is effective as long as it encourages them to progress through the learning content or to influence their behavior and actions. Each game impacted participants' cognitive, emotional, and social areas because it helps to work mainly with the concepts of success and failure.

On the other hand, pronunciation instruction should be incorporated into EFL teaching methodologies, not as a translation method but innovatively and creatively. English learners are primarily interested in improving their pronunciation in the target language, which is advantageous for innovating and generating these spaces in education.

Finally, the appropriate use of technology is a great tool in language teaching. It plays an interesting role in the creativity of any teacher as a mediator of competencies and skills in students to incorporate their knowledge in solving problems and situations not only in their field of study but also at an interdisciplinary level.

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Appendices

Appendix A

Characterization survey



**GAMIFICATION
THINKING TO**

GTIEP Characterization Form

The purpose of this questionnaire is to determine some characteristics as an English learner in the Pronunciacion improvement process.

The name and photo associated with your Google account will be recorded when you upload files and submit this form.

Not leidyviviana.perez@uptc.edu.co? [Switch account](#)

* Required

Información de Contacto: leidyviviana.perez@uptc.edu.co

Full name *

Your answer

ID number *

Your answer

Please chose your gendre. *

- Female
- Male
- Prefer not to say

Age

- 15-20 years old
- 20-30 years old
- 30-40 years old
- more than 40 years old

Academic program *

- Public Accounting
- Business Administration
- Finance and International Trade
- Electronic Engineering
- Mining Engineering
- Geological Engineering
- Industrial Engineering
- Systems and Computer Engineering
- Other: _____

I think games are useful elements to improve my English pronunciations skills.
 STRONGLY DISAGREE ___1:___2:___3:___4:___5:___6:___7 STRONGLY AGREE *

1	2	3	4	5	6	7
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

My motivation to learn English pronunciation for practical purposes (e.g., to get a good job) is: WEAK ___1:___2:___3:___4:___5:___6:___7 STRONG *

1	2	3	4	5	6	7
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Studying English Pronunciation can be important for me because I will be able to interact with native English speakers.

STRONGLYDISAGREE ___1:___2:___3:___4:___5:___6:___7 STRONGLY AGREE *

1	2	3	4	5	6	7
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

According to your Placement Test results, please select your score based on the Common European Framework (CEFR) Proficiency Scale *


- A1
- A2
- B1
- B2
- C1
- C2

Please upload here your English Placement Test Results PDF

[Add file](#)

Appendix B

EFL Students' questionnaire



**GAMIFICATION
THINKING TO**

Game interaction and pronunciation factors


The purpose of this questionnaire is to determine game factors in English as a Foreign Language (EFL) mediation to strengthen students' pronunciation at UPTC Sogamoso.

* Required

Email address *

Your email

Información de Contacto: leidyviviana.perez@uptc.edu.co



Each item is followed by a scale that has a label on each side, and the numbers 1-5 between the two extremes: strongly agree and strongly disagree. For each item, please circle any of the numbers from 1 to 5 that best describes you and your English pronunciation process.

*

	STRONGLY DISAGREE 1	2	3	4	STRONGLY AGREE 5
1- The games' goals were clear and easy to identify.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2- The instructions about sound articulation were	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3- The instructions given on each pronunciation feature followed the goals set out in each game.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*

	STRONGLY DISAGREE 1	2	3	4	STRONGLY AGREE 5
4- The games were challenging.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5- I could complete the challenges and finish the stages in the virtual course.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6- Game challenges were favorable to master English pronunciation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*

	STRONGLY DISAGREE 1	2	3	4	STRONGLY AGREE 5
7- Audiovisual elements made the games attractive to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8- I enjoyed learning English pronunciation in this course.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9- The sensations in each game stimulated my interest in mastering my English pronunciation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*

	STRONGLY DISAGREE 1	2	3	4	STRONGLY AGREE 5
10- The games allowed me to cooperate or compete with others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11- Exposure to English during the course has made it easier to acquire good pronunciation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12- Cooperation or competition contributes to experience and practice pronunciation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Do you think the professor used activities, resources and games according to the course aims and your expectations? *

YES

NO

14. Explain your answer for question 13

Your answer _____

Next

Page 1 of 2

Appendix C

Characterization survey: data treatment question

The information provided in this survey is intended to provide some specific characteristics as a EFL learner. The data will be handled confidentially and used in research projects with the aim of improving the quality of English language pedagogical mediation. Do you agree? *

YES

NO

Next

 Page 1 of 2

Appendix D

Informed consent letter (English version)

Project title:

GAMIFICATION IN E-LEARNING: GAME FACTORS TO STRENGTHEN SPECIFIC ENGLISH PRONUNCIATION FEATURES IN UNDERGRADUATE STUDENTS AT UPTC SOGAMOSO

Objective: To analyze the gaming factors in English as a Foreign Language (EFL) mediation to strengthen the specific features of students' pronunciation at UPTC Sogamoso.

General research procedure: Diagnostic, Action Plan, Observation, and Analysis.

Average duration: 6 months

Date:	
Participant's name :	
Identification Document number:	
City and address of residence:	
Contact telephone number:	
Name of the guardian or legal representative:	
Identification document	
City and address of residence:	
Contact telephone number:	
Principal Investigator:	Leidy Viviana Pérez Cárdenas
Contact telephone number:	3134806038
E-mail address:	deidy114@hotmail.com
Entidades Participantes:	UNAD-UPTC

My name is _____, with I.D. N° _____, as a participant of GAMIFIED THINKING TO IMPROVE ENGLISH PRONUNCIATION course, I accept voluntarily to be included as a subject of study in the research project called GAMIFICATION IN E-LEARNING: GAME FACTORS TO STRENGTHEN SPECIFIC ENGLISH PRONUNCIATION FEATURES IN UNDERGRADUATE STUDENTS AT UPTC SOGAMOSO, after having fully and clearly known and understood the information, objectives, and goals of this research for academic purposes, to which no physical or mental risk is granted in my participation in the study (Resolution 8430 of 1. 993, Art.11), and with the understanding that:

- My participation as a student will not affect my activities or evaluations scheduled in the course, nor will it affect my relations with the institution I am enrolled with.
- There will be no penalty for me if I do not accept the invitation.

- I can withdraw from the project if I consider it convenient to my interests, even if the responsible researcher does not request it. I will inform my reasons for such a decision in the respective Letter of Revocation if I consider it pertinent, if I wish, to recover all the information obtained from my participation.
- I will not incur any expenses, nor will I receive any remuneration for participation in the study.
- The data obtained as a result of my participation will be kept strictly confidential. The information collected (photos, videos, recordings, writings, interviews, surveys) will be used and kept by the researcher (Ley 1581 de 2012).
- If in the results of my participation as a student any problem related to my teaching-learning process becomes evident, I will be given guidance in this regard.
- During the study, I may request updated information about the study from the responsible researcher.
- I was notified that all information will be guided by applying the articles referred to the confidentiality norms established in the constitutional rights (Artículo 8° de la Ley 1581 de 2012 / Decreto 1377 de 2013).
- If I have any questions, I will not hesitate to ask the researcher, who will gladly clarify my concerns.

Given the above, I freely and voluntarily give my consent to participate in this study. I further confirm that a copy of this consent has been given to me.

Consciously, in use of my full faculties, I sign on the _____ (day) ____ (month) _____ (year).

Signature of participant or legal representative

Name of the participant or legal representative

CC No: _____ from _____

REVOCATION OF CONSENT LETTER

My name is _____, as a participant of the GAMIFIED THINKING TO IMPROVE ENGLISH PRONUNCIATION course and in the educational research project called GAMIFICATION IN E-LEARNING: GAME FACTORS TO STRENGTHEN SPECIFIC ENGLISH PRONUNCIATION FEATURES IN UNDERGRADUATE STUDENTS AT UPTC SOGAMOSO, I wish to express my decision to withdraw from it.

In this case, I submit the following reasons: (optional)

Place and date: _____

Signature of the participant or legal representative

Name of participant or legal representative

CC No: _____ from _____

Appendix E

Carta de consentimiento informado (versión en español)

Nombre del Proyecto:

GAMIFICATION IN E-LEARNING: GAME FACTORS TO STRENGTHEN SPECIFIC ENGLISH PRONUNCIATION FEATURES IN UNDERGRADUATE STUDENTS AT UPTC SOGAMOSO

Objetivo: Analizar los factores de juego en la mediación del inglés como lengua extranjera (EFL) para fortalecer las características específicas de la pronunciación de los estudiantes de la UPTC Sogamoso. **Procedimiento:** Diagnostico, Plan de acción, observación, reflexión

Duración: 6 meses

Fecha:			
Nombre del participante:			
Documento de identificación		No:	
Ciudad y dirección de residencia:			
Teléfono de contacto:		Celular:	
Nombre del tutor o representante legal:			
Documento de identificación		No:	
Ciudad y dirección de residencia:			
Teléfono de contacto:		Celular:	
Investigador Principal:	Leidy Viviana Pérez Cárdenas		
Teléfono de contacto:		Celular:	3134806038
Correo electrónico:	deidy114@hotmail.com		
Entidades Participantes:	UNAD-UPTC		

Yo _____, identificado con documento de identidad N° _____ participante del curso de GAMIFIED THINKING TO IMPROVE ENGLISH PRONUNCIATION y de ____ años de edad, acepto de manera voluntaria que se me incluya como sujeto de estudio en el proyecto de investigación denominado GAMIFICATION IN E-LEARNING: GAME FACTORS TO STRENGTHEN SPECIFIC ENGLISH PRONUNCIATION FEATURES IN UNDERGRADUATE STUDENTS AT UPTC SOGAMOSO, luego de haber conocido y comprendido en su totalidad y con claridad, la información, objetivos y metas de esta investigación con fines académicos, ante los cuales no se concede ningún riesgo físico o mental en mi participación en el estudio (Resolución 8430 de 1.993, Art.11), y en el entendido de que:

- Mi participación como alumno no repercutirá en mis actividades ni evaluaciones programadas en el curso, no repercutirá en mis relaciones con mi institución de adscripción.
- No habrá ninguna sanción para mí en caso de no aceptar la invitación.
- Puedo retirarme del proyecto si lo considero conveniente a mis intereses, aun cuando el investigador responsable no lo solicite, informando mis razones para tal decisión

en la Carta de Revocación respectiva si lo considero pertinente; pudiendo si así lo deseo, recuperar toda la información obtenida de mi participación.

- No haré ningún gasto, ni recibiré remuneración alguna por la participación en el estudio.
- Se guardará estricta confidencialidad sobre los datos obtenidos producto de mi participación. La información recopilada (fotos, videos, grabaciones, escritos, entrevistas, encuestas) será usada y guardada por el investigador.
- Si en los resultados de mi participación como alumno se hiciera evidente algún problema relacionado con mi proceso de enseñanza – aprendizaje, se me brindará orientación al respecto.
- Puedo solicitar, en el transcurso del estudio información actualizada sobre el mismo, al investigador responsable.
- Se me notificó que toda información se guiará aplicándose los artículos referidos a las normas de confidencialidad establecidas en los derechos constitucionales (Artículo 8° de la Ley 1581 de 2012 / Decreto 1377 de 2013).
- Si tengo alguna pregunta no dudaré en hacerla al investigador, quien con mucho gusto aclarará sus inquietud

Teniendo en cuenta todo lo anterior, de manera libre y voluntaria doy mi consentimiento para participar en el proyecto descrito. Además, confirmo que se me ha sido entregada una copia de este consentimiento. Conscientemente, en uso de mis plenas facultades, firmo el día ____ del mes de _____ del año _____.

Firma del participante o representante legal

Nombre del participante o representante legal

CC No: _____ de _____

CARTA DE REVOCACIÓN DEL CONSENTIMIENTO

Yo _____, participante del curso de GAMIFIED THINKING TO IMPROVE ENGLISH PRONUNCIATION y de _____ años de edad, participante en el proyecto de investigación educativa, denominado GAMIFICATION IN E-LEARNING: GAME FACTORS TO STRENGTHEN SPECIFIC ENGLISH PRONUNCIATION FEATURES IN UNDERGRADUATE STUDENTS AT UPTC SOGAMOSO deseo manifestar mi decisión de retirarme del mismo.

Para el caso someto las siguientes razones: (opcional)

Lugar y fecha: _____

Firma del participante o representante legal

Nombre del participante o representante legal

CC No: _____ de _____

suprasegmental needs.		
4. To integrate interactive pronunciation gaming tools and critical thinking activities into English lessons to emphasize important pronunciation areas.		
5. Recording and filling in a reflective diary that mainly includes perceptions, outcomes, and thoughts on improvement.		
6. To apply a questionnaire to the EFL learners focusing on their perceptions and awareness about speaking intelligible		

pronunciation own process.		
7. To implement a post-test to diagnose learners' English pronunciation improvements .		
8. Classification, tabulation, codification and systematizatio n of data collection.		
9. Analysis of the findings. Reflective description of the effects of game intervention in pronunciation instruction		
10.Design, edition, and production of the expected products to disseminate knowledge: paper, article.		



Appendix G

Sample Challenges at Moodle


Gamification To Improve English Pronunciation

WELCOME
CHALLENGE 1
CHALLENGE 2
CHALLENGE 3
CHALLENGE 4
CHALLENGE 5
CHALLENGE 6
CHALLENGE 7
CHALLENGE 8

CHALLENGE 9
CHALLENGE 10
WEEK 10
Week 14
Final Challenge





Watch the videos to see how the /ð/ sound is pronounced.



bbclearningenglish.com


Source: BBC learning English http://www.bbc.co.uk/worldservice/learningenglish/grammar/pron/sounds/con_voiceless_ð_s.htm




[t], [d] and "th" sound from mauricioelhombro

Let's prepare 5

Watch the videos and practice the articulation of the sound.





Kahoot TH Challenge

[Click here to access the game, challenge your skills!](#)

- WELCOME
- CHALLENGE 1
- CHALLENGE 2
- CHALLENGE 3
- CHALLENGE 4
- CHALLENGE 5
- CHALLENGE 6
- CHALLENGE 7
- CHALLENGE 8
- CHALLENGE 9
- CHALLENGE 10
- WEEK 10
- Week 14
- Final Challenge

Gaming Podium (s-ending pronunciation) Congrats!!



Hidden from students

Quizizz (Iz, s, z) Pronunciation.

3 Sounds of the Plural "s" in English: [s], [z] or [ɪz]



Final S Pronunciation

Pronunciation of S AT THE END OF WORDS

/ɪz/ SIBILANT	/s/ VOICELESS	/z/ VOICED
C races S buses X boxes Z prizes SS kisses CH watches SH dishes GE changes	P sleeps K books T hats F cliffs GH laughs PH graphs	B crabs D words G bags L falls M dreams N fans NG sings R wears V gloves

There are 3 ways of pronouncing S at the end of a word in English. The pronunciation of words ending in S depends on the final consonant sound.

/ɪz/ Sometimes written as /əz/

Words that end in a vowel sound use the /z/ pronunciation for S.
e.g. -- plays -- sees -- tries -- follows -- continues

- **Sibilant Sound** - = a hissing or buzzing sound.
- **Voiceless Sound** - = the vocal cords do not vibrate.
- **Voiced Sound** - = uses the vocal cords and they produce a vibration or humming sound in the throat.

www.grammar.cl www.woodwardenglish.com www.vocabulary.cl

INTERACTIVE LESSON S, Z, IZ

Nearpod Interactive Lesson on Final "s" pronunciation

Welcome to Your Lesson

Pronunciation of S at the end of the word (1)

Contact us at support@nearpod.com

Gamification To Improve English Pronunciation

WELCOME CHALLENGE 1 CHALLENGE 2 CHALLENGE 3 CHALLENGE 4 CHALLENGE 5
 CHALLENGE 6 CHALLENGE 7 CHALLENGE 8 CHALLENGE 9 CHALLENGE 10 WEEK 10 Week 14
 Final Challenge

Get around in ENGLISH Get around in ENGLISH Lesson Seventy-two How to Pronounce the th sound

English Pronunciation - Voiceless Consonant - /θ/ - 'thin', 'throw' & 'thumb'

Watch the video to see how both sounds are pronounced.



Let's prepare 4

My courses This course Hide blocks Standard view

Watch the videos and practice the articulation of these sounds.

Pronunciation: Voiceless TH sound



CONCENTRATION GAME TH

Play memory or complete a word search with words having "th" somewhere in the middle

Challenge Board: Score points by answering questions

Hangman: Guess the letters in a hidden word or phrase.

TH Battleship

Appendix H

Participants' questionnaire results

Table H1

Instructions about sound articulation

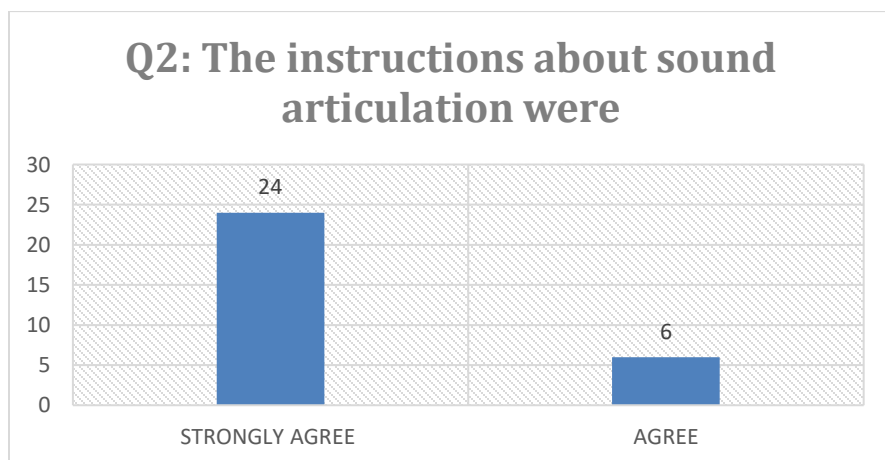


Table H2

Instructions for pronunciation followed the game goals

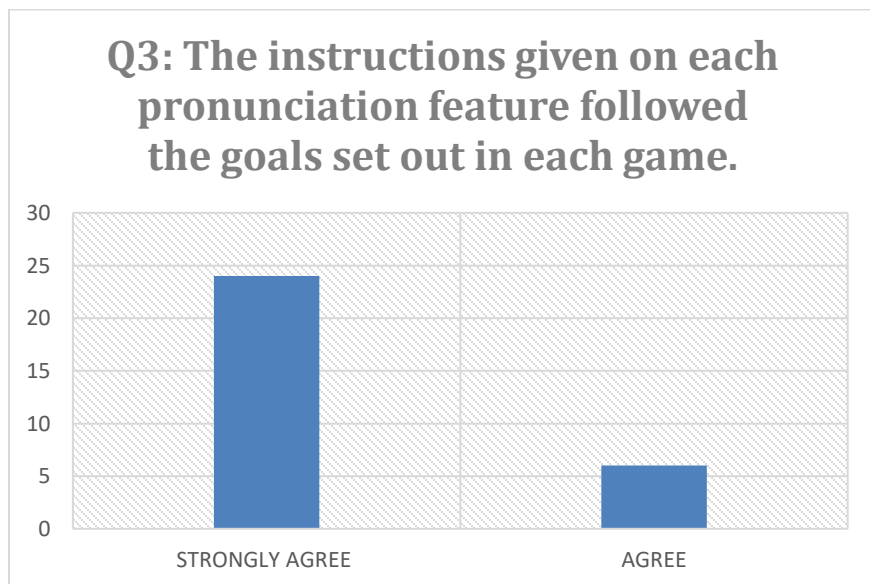


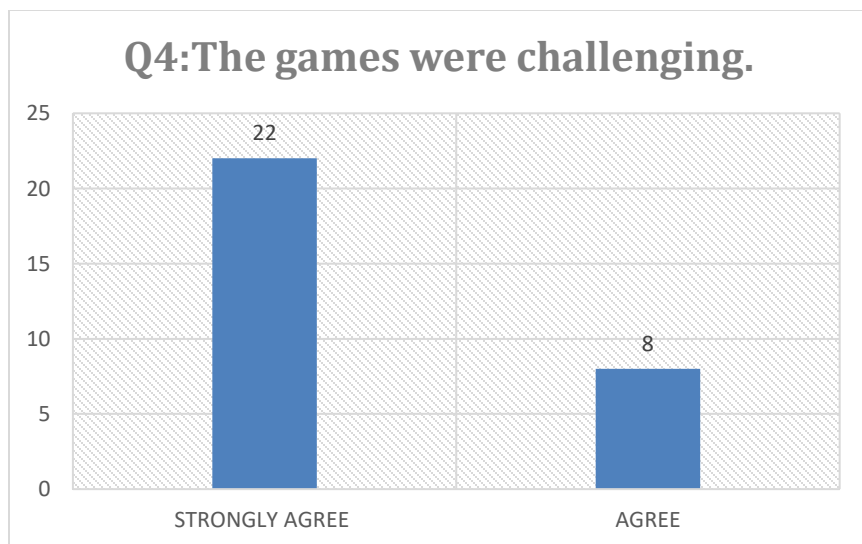
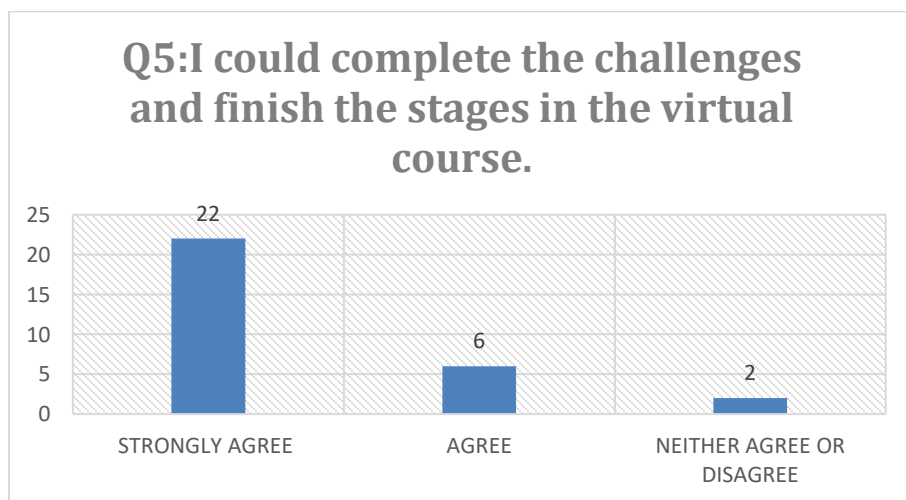
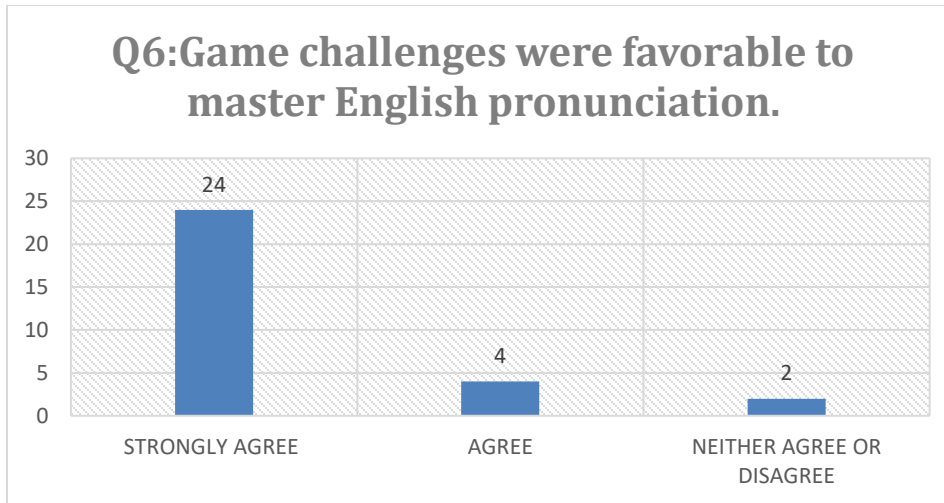
Table H3*Challenging games***Table H4***Attitude toward games*

Table H5

Challenges favorability toward English pronunciation

**Table H6**

Sensation

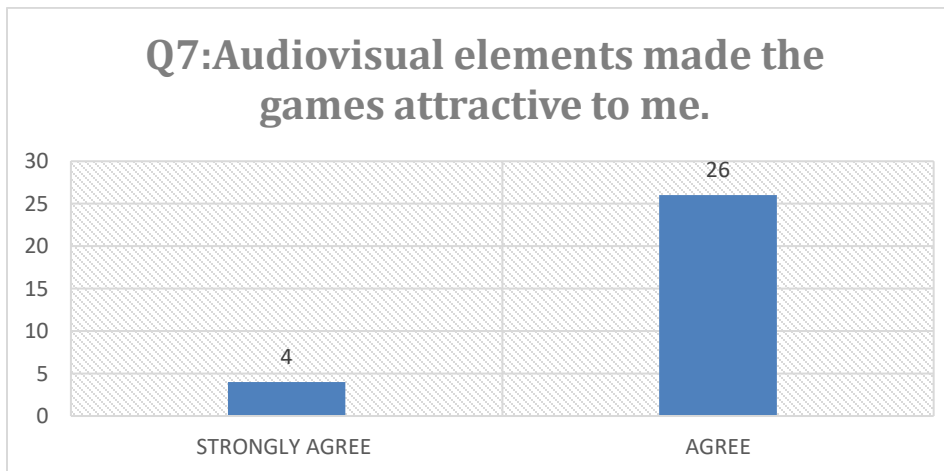


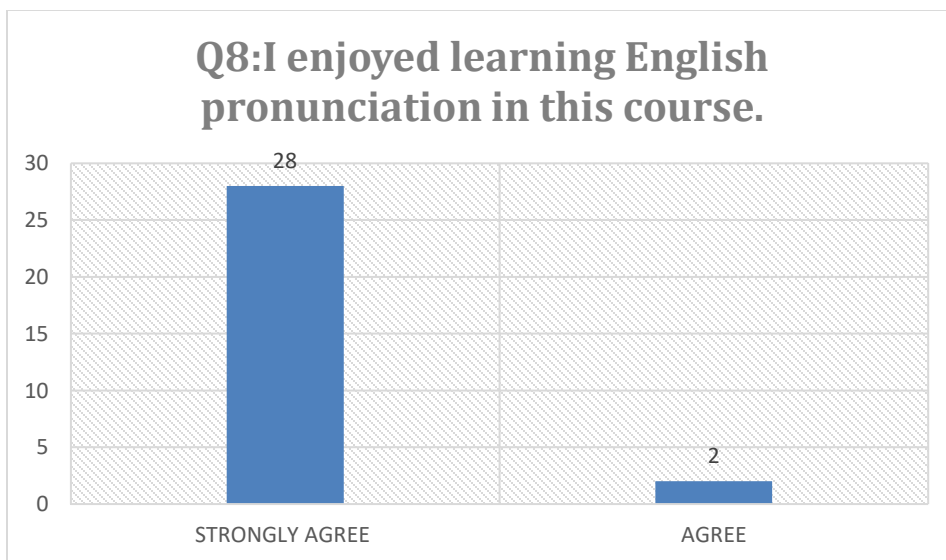
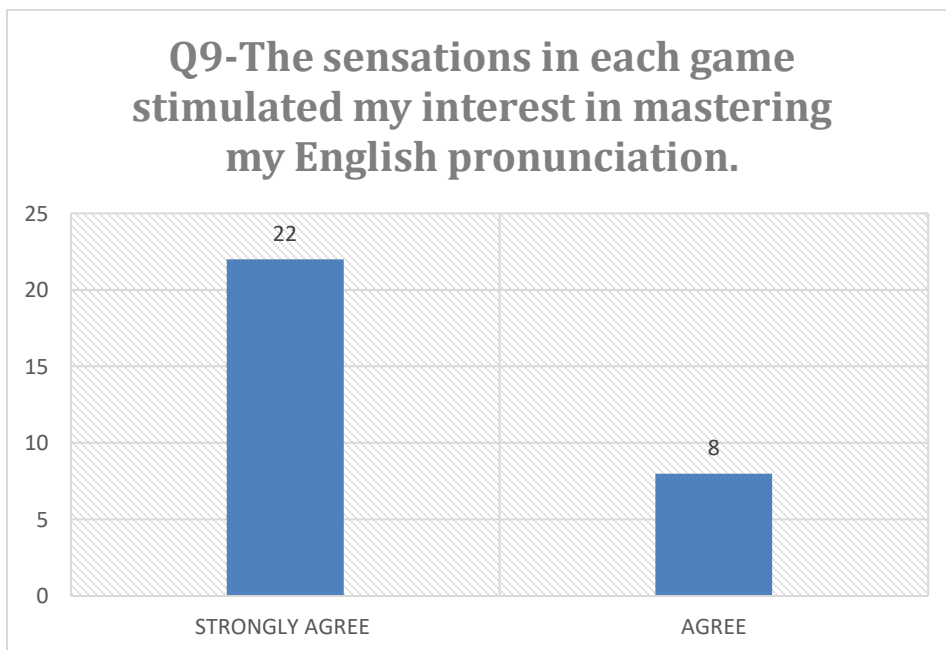
Table H7*Motivation***Table H8***Sensation related to motivation*

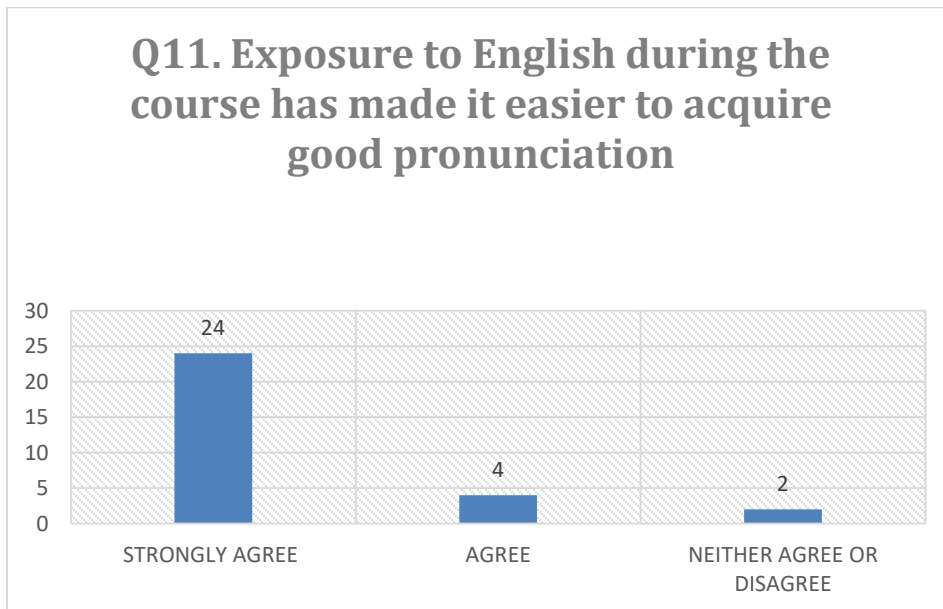
Table H10*Sociability***Table H8***Exposure*

Table H11*Sociability and Exposure*