

People's Democratic Republic of Algeria
Ministry of Higher Education and Scientific Research

Kasdi Merbah University- Ouargla

Faculty of Letters and Languages
Department of Letters and English Language



Dissertation submitted in partial fulfilment of the requirements for the Master's
Degree in the field of English Language and Literature

Major: **Linguistics**

The Role of Digital Tools in Enhancing EFL Students' Pronunciation Skill

***The Case of First Year Licence Students at the Department of
Letters and English Language- Kasdi Merbah University -
Ouargla, Algeria***

Submitted and publicly defended by:

Nadjat ABID & Ouissem BOUDOUMI

Supervised by:

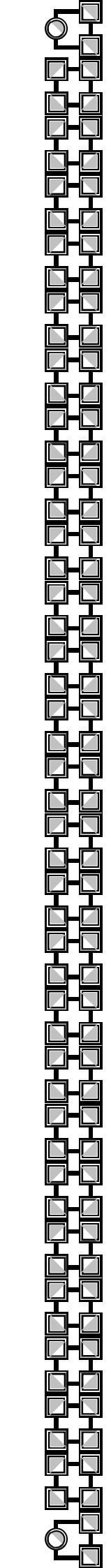
Prof. Halima BENZOUKH

Board of Examiners

Dr. Saifeddine GUENDOUZ	University of Ouargla	President
Prof. Halima BENZOUKH	University of Ouargla	Supervisor
Dr. Madjid DOUFENE	University of Ouargla	Examiner

Academic Year

2025/2026



Dedication

In the name of Allah, the Most Merciful, the Most Compassionate

**First and foremost, all praise and gratitude are due to Allah, the Most Merciful,
for granting me the strength, patience, and perseverance to complete this work**

**To my parents: without their guidance and blessings, this achievement would not
have been possible.**

Nadjat

**This dissertation is dedicated to my beloved parents, whose endless prayers,
unconditional love, and constant support have been the foundation of every
success in my life. I am forever grateful for your sacrifices and unwavering faith in
me**

Ouissem

Acknowledgements

We would like to extend our sincere thanks and appreciation to our supervisor, Prof. Halima Benzoukh, for her invaluable guidance, support, and encouragement throughout this work.

Our sincere gratitude also goes to the members of the jury for accepting to evaluate this work and for their valuable time and insightful comments.

We are also thankful to the administration and the faculty members of the Department of English at Kasdi Merbah University of Ouargla for providing a supportive academic environment. Special thanks are due to the first-year licence students who participated in this study; without their cooperation, this research would not have been possible.

We sincerely thank the teachers who participated in the interviews and generously shared their time and insights. Their contributions were invaluable to this study.

Finally, we would like to thank everyone who contributed, directly or indirectly, to the completion of this dissertation.

Abstract

This study investigates the impact of integrating digital tools on the pronunciation skill of first-year Licence students of English at Kasdi Merbah University of Ouargla. Despite receiving formal phonetics instruction, many first-year students still struggle with English segmental and suprasegmental features due to limited exposure and traditional teaching methods. Therefore, this study is adopted a mixed-methods approach using a students' questionnaire and a teachers' interview to collect both quantitative and qualitative data. The findings reveal that the strategic use of digital tools significantly improves learners' phonemic awareness and reduces students' anxiety about producing a foreign accent. In the meantime students perceived improvement Moreover, they indicate that real-time feedback and interactive auditory models foster a more autonomous and engaging learning environment compared to conventional classroom drills. Based on these findings, the study offers pedagogical recommendations for teachers and course designers at the University of Ouargla to formalize the integration of technological tools into teaching phonetics and oral comprehension expression modules.

Keywords: Digital tools, English pronunciation, learning, anxiety, phonemic awareness.

III

List of Abbreviations

APA:	American Psychological Association
ASR:	Automatic Speech Recognition
CALL:	Computer-Assisted Language Learning
CAPT:	Computer-Assisted Pronunciation Teaching
CLT:	Communicative Language Teaching
EFL:	English as a Foreign Language
ELT:	English Language Teaching
ESL:	English as a Second Language
ESP:	English for Specific Purposes
ICT:	Information and Communication Technology
L1:	First Language
L2:	Second Language
MALL:	Mobile-Assisted Language Learning
SLA:	Second Language Acquisition
TEFL:	Teaching English as a Foreign Language
TL:	Target Language

List of Tables

Table 1 Key Methodological Elements at a Glance	33
Table 2 Students' Speaking Proficiency.....	36
Table 3 Digital Tools' Usage	38
Table 4 Digital Perfections.....	39
Table 5 Teacher A Responses to the Interview Questions	40
Table 6 Teacher B Responses to the Interview Questions	41

Table of Contents

Dedication	I
Acknowledgements	II
List of Abbreviations	IV
List of Tables	V
Table of Contents	VI
General Introduction	1
1. Background of the Study	1
2. Statement of the Problem	2
3. Aims of the study	3
4. Research Questions	4
5. Research Hypotheses	5
6. The Significance of this Study	6
7. Scope of the Study	8
8. Limitations of the Study	9
9. Definition of Key Terms	10
10. Methodology	11
11. Organisation of the Dissertation	14
Chapter One: Literature Review	15
Introduction	15
1.1 Theoretical Background on Pronunciation in EFL	15
1.2 The Role of Digital Tools in Improving Pronunciation	17
1.3 Traditional Approaches of Teaching Pronunciation	20
1.4 Teaching and Learning Pronunciation in EFL	21
1.5 Studying Segmental Features in EFL	21
1.6 Studying Supra-segmental Features in EFL	22
1.7 Research Gap	23

Conclusion	24
Chapter Two: Methodological Framework	26
Introduction	26
2.1 Research Design	26
2.2 Population and Sample	27
2.3 Data Collection Instruments	28
2.3.1 Students' Questionnaire	28
2.3.2 Teachers' Interview	28
2.4 Data Analysis Procedure	29
2.5 Ethical Considerations	29
2.5.1 Confidentiality	29
2.5.2 Voluntary Participation	29
2.5.3 Informed Consent	29
2.5.4 Academic Use of Data	30
2.6 Explanatory Sequential Mixed-Methods Design	30
Conclusion	30
Chapter Three: Results and Data Analysis	32
Introduction	34
3.1 Speaking Proficiency and Challenges	34
3.2 Pronunciation Difficulties	34
3.3 The Use of Digital Tools	36
3.4 The Impact of Digital Tools	37
3.5 Attitudes toward Digital Tools	39
3.6 Interpretation of the Results	41
Conclusion	44
General Conclusion	45
List of References	49
Appendices	54

Résumé

64

الملخص

65

General Introduction

1. Background of the Study

In today's globalized world, English has become an international language used in education, technology, business, and global communication (Benzoukh, 2022). As a result, English language proficiency is now a crucial requirement for academic and professional success. In many non-English-speaking countries, including Algeria, English is taught as a Foreign Language (EFL) at different educational levels, with universities playing a key role in developing students' communicative abilities.

Among the different aspects of language learning, pronunciation holds a central position because it directly affects speaking and understanding. Proper pronunciation helps learners communicate their intended meaning clearly and confidently.

However, pronunciation remains one of the most challenging aspects of English learning for EFL students, especially at the university level. Many learners struggle with stress, rhythm, and intonation due to limited exposure to authentic materials and interference from their first language (Gimson, 1980).

In recent years, digital technology has significantly influenced language teaching and learning. Mobile applications, online platforms, audiovisual materials, and speech-recognition technologies have created new opportunities for language practice (Kunova & Kralova, 2025). These tools provide learners with access to authentic language and support the development of pronunciation skills beyond the traditional classroom.

In the Algerian university context, particularly at Kasdi Merbah University, first-year licence EFL students often experience pronunciation difficulties at the early stages of

learning English. Large class sizes and limited classroom time reduce opportunities for practice. Therefore, integrating digital tools into pronunciation teaching may offer an effective and supportive approach to enhancing students' learning experience.

2. Statement of the Problem

Despite the long years of English study, first-year licence EFL students at Kasdi Merbah University of Ouargla still encounter serious problems in English pronunciation. This is particularly true in terms of the inaccuracy of English sound production, the inappropriate use of English stress and intonation, and the lack of intelligibility of English pronunciation during English oral communication. Such pronunciation problems may impede the students' successful participation in English oral interactions and influence their confidence in English speaking. One of the main reasons for these pronunciation difficulties is the lack of attention given to pronunciation in the traditional EFL where greater emphasis is placed on grammar, reading, and writing.

Furthermore, the large number of students and the lack of time for English instruction may impede the students' successful English pronunciation.

Although digital tools for pronunciation are accessible to students, their pedagogical potential for addressing the pronunciation difficulties of first-year licence EFL students at Algerian universities has not been sufficiently investigated.

3. Aims of the study

The main aim of this study is to explore the impact of digital tools on improving the pronunciation of first-year licence EFL students at Kasdi Merbah University. More specifically, the study sought to examine the contribution of digital tools to enhancing

students' pronunciation performance and to investigate their perceptions of using these tools for pronunciation practice.

This research adopts a mixed-methods approach. It uses a questionnaire administered to first-year EFL students and semi-structured interviews with teachers to explore the role of digital tools in pronunciation learning.

The study is expected to contribute to a better understanding of the effectiveness of technology-assisted pronunciation practice and to provide useful implications for EFL teaching in Algerian universities.

4. Research Questions

This study aims to provide an answer to the following research questions:

- 1)- What pronunciation difficulties do first-year licence EFL students at Kasdi Merbah University of Ouargla face?
- 2)- How do digital tools support the pronunciation learning of first-year EFL students?
- 3)- What is the role of digital tools in enhancing pronunciation learning among first-year EFL students?
- 4)- What are the attitudes of first-year licence EFL students towards the use of digital tools in pronunciation learning?

5. Research Hypotheses

Based on the research questions, the following research hypotheses are formulated:

- 1)- First-year EFL students at Kasdi Merbah University of Ouargla experience significant difficulties in English pronunciation.

2)- Digital tools significantly support the learning of English pronunciation among first- year EFL students.

3)- Students who use digital tools achieve better pronunciation than those who use traditional methods.

4)- First-year EFL students have positive attitudes toward the use of digital tools in learning English pronunciation.

6. The Significance of this Study

The significance of this study lies in its potential contribution to both academic and pedagogical fields. From an academic perspective, the study added to the existing literature on the use of digital tools in EFL pronunciation teaching, particularly within the Algerian university context, which has received limited research attention.

From a pedagogical perspective, the study had provided EFL teachers with insights into how digital tools can be effectively integrated into pronunciation teaching. It also aims to raise students' awareness of the importance of pronunciation and promote learner autonomy through the use of technology.

From a practical standpoint, the findings may support the integration of technology-based pronunciation activities into university EFL programs. The results could also be useful for curriculum developers and educational policymakers by highlighting the importance of incorporating technology-assisted pronunciation practice into university EFL courses.

7. Scope of the Study

This study aims to investigate the role of digital tools in enhancing EFL students' pronunciation, with particular reference to first-year licence students at Kasdi Merbah

University of Ouargla, Algeria. It seeks to explore how digital tools, such as mobile applications, online dictionaries, pronunciation software, and multimedia resources, contribute to the development of students' pronunciation skills.

The research focuses specifically on English pronunciation, including selected segmental features vowels and consonants and suprasegmental features stress and intonation. It examines students' use of digital tools as supplementary learning resources both inside and outside the classroom. The study adopted a descriptive research design in order to analyze students' perceptions, attitudes, and practices regarding the integration of digital tools in pronunciation learning.

The participants are limited to first-year EFL licence students at Kasdi Merbah University of Ouargla. Therefore, the findings are intended to reflect the reality of this specific academic context.

8. Limitations of the Study

Despite its significance, this study is subject to certain limitations. First, the research is confined to a single academic level and one university, which may restrict the generalizability of the findings to other educational contexts.

Second, the study has relied primarily on self-reported data collected through research instruments such as questionnaires. Consequently, the accuracy of the findings may be influenced by participants' honesty and subjective perceptions.

Third, time constraints and limited access to participants may have affected the scope of data collection and analysis. Furthermore, the study did not employ an experimental design to measure actual long-term improvement in pronunciation; rather, it focuses on students' perceptions of the effectiveness of digital tools.

9. Definition of Key Terms

For the purpose of this study, the following key terms are defined as follows:

1. Digital Tools

Digital tools are electronic technologies, software applications, online platforms, and multimedia resources used to facilitate teaching and learning. In language education, digital tools may include mobile applications, speech recognition software, online dictionaries, language-learning platforms, podcasts, videos, and computer-assisted language learning programs that support pronunciation practice and feedback (Ahmadi, 2018).

2. Pronunciation Skill

Pronunciation skill refers to a learner's ability to produce English sounds and speech patterns accurately and intelligibly so that spoken messages can be understood by listeners. It involves mastery of phonemes, word stress, sentence stress, rhythm, intonation, and overall speech clarity (Benzoukh, 2022).

10. Methodology

The chosen approach in the present study is a mixed-methods approach. The research design adopted is an explanatory sequential design, which combines quantitative and qualitative data in order to obtain a deeper understanding of the research problem.

A randomly selected group of 50 first-year EFL students from the Department of Letters and English Language at Kasdi Merbah University of Ouargla was chosen to participate in the study. In addition, two EFL teachers were selected to provide professional insights through interviews.

The data were collected through two research instruments:

A questionnaire administered to students to gather quantitative data about their pronunciation difficulties, their use of digital tools, and their attitudes toward technology in learning pronunciation.

Semi-structured interviews conducted with teachers to obtain qualitative data about their perspectives on the effectiveness of digital tools in pronunciation teaching.

The questionnaire results were analyzed using descriptive statistics (percentages and frequencies), while the interview data were analyzed using thematic analysis. The combination of these two methods aims to determine the effectiveness of technological tools in improving EFL learners' pronunciation skills.

11. Organisation of the Dissertation

The present dissertation is divided into three chapters.

The first chapter presents the theoretical framework of the study. It introduces pronunciation in EFL contexts and reviews the role of digital tools in language learning and pronunciation development.

The second chapter focuses on the research methodology. It describes the research design, participants, data collection instruments, and the procedures used to analyze the collected data.

The third chapter presents the results and discussion of the study. It analyzes the questionnaire and interview findings and discusses them in relation to the research questions and hypotheses.

Finally, the dissertation ends with a general conclusion that summarizes the main findings and provides pedagogical recommendations and suggestions for future research.

Chapter One: Literature Review

Introduction

The teaching and learning of English have undergone a major shift from traditional methods to more dynamic and technology-oriented approaches. All language skills are essential for communicative competence; however, pronunciation remains one of the most challenging aspects for EFL learners. Previous studies such as Talebi (2010) and Blake (2013) highlighted that classroom constraints, including limited time and large class sizes, often lead to the fossilization of learners' phonetic errors.

These challenges have encouraged the integration of digital tools in pronunciation learning. Early uses of digital tools aimed to create stress-free environments where learners could experiment with sounds without fear of social judgment (Gkonou, 2011). Today, research suggests that we have entered the era of Experimental Precision, where digital technologies are no longer supplementary but essential for providing data-driven feedback on learners' pronunciation (Kunova & Kralova, 2025).

Therefore, understanding the role of digital tools in pronunciation learning is no longer optional but necessary for improving learners' speaking skills (Asratie et al., 2023).

1.1 Theoretical Background on Pronunciation

Digital pronunciation teaching originates from Computer-Assisted Pronunciation Teaching (CAPT). Initially, CAPT followed behaviorist "listen-and-repeat" models. Lewis (2007) established key criteria for effective computer-assisted pronunciation systems, emphasizing their ability to provide specific and corrective feedback at both segmental and suprasegmental levels.

Later research by Saleh and Gilakjani (2021) demonstrated that CAPT evolved into a mature learning medium capable of improving learners' pronunciation through controlled yet flexible learning environments. Since the early 2010s, a major shift has occurred from passive software environments to Technology-Enhanced Learning (TEL). Jingjing and Andi (2024) explained that TEL enables blended learning environments that connect phonetics theory with linguistic practice.

A major milestone in this evolution is the transition from static software to Artificial Intelligence (AI). Lewis and Suvorov (2014) explored the potential of Automatic Speech Recognition (ASR), despite its early limitations in recognizing non-native speech. With the emergence of deep learning and neural networks, the field has rapidly advanced. Recent research by Djafar and Hamidah (2024) has confirmed that AI-based speech recognition now offers high levels of accuracy and detailed phonetic feedback comparable to human instruction.

Furthermore, Sun (2023) argued that ASR technology not only helps learners correct pronunciation, but also improves the efficiency of speech-to-text and text-to-speech tools, allowing learners to compare perceived and actual pronunciation more effectively.

Overall, the integration of AI and digital tools has reshaped pronunciation teaching and created new opportunities for EFL learners.

1.2 The Role of Digital Tools in Improving Pronunciation

The integration of technology into phonetics represents a significant shift beyond the limitations of traditional language teaching. Within the broader field of Computer-Assisted Language Learning (CALL), digital technology was initially valued for promoting learner autonomy and privacy.

Higgins and Johns (1984) famously described the computer as a “patient tutor,” allowing learners to practice pronunciation repeatedly without the social pressure often experienced in classroom environments.

One of the earliest and most influential contributions of digital tools was the introduction of visual feedback. During the late 1980s and early 1990s, technologies such as visual pitch displays and waveform analysis enabled learners to see their speech. Different studies demonstrated that when learners compare their own intonation patterns with those of native speakers, they become more capable of self-correction.

This combination of visual and acoustic feedback laid the foundation for Computer-Assisted Pronunciation Teaching (CAPT). Over time, technology also began to support the management of input and interaction. Warschauer (1996) highlighted the transition from Structural CALL to Communicative CALL, where technology moved beyond mechanical drills toward meaningful interaction.

Chapelle (1998) further argued that digital environments provide optimal input, allowing learners to notice pronunciation gaps through interaction and negotiation of meaning.

By combining auditory models, visual representations, and immediate diagnostic feedback, digital tools create a bridge between learners’ internal phonetic perception and external acoustic production—something that was largely impossible in purely traditional classrooms (Neri et al., 2002).

1.3 Traditional Approaches of Teaching Pronunciation

Before the rise of digital tools, learners had limited opportunities to practice pronunciation outside the classroom. Nevertheless, traditional teaching methods played a

crucial role in establishing pronunciation as an important component of language education and in developing learners' phonological awareness.

Traditional pronunciation instruction was largely teacher-centred and focused on accuracy, imitation, and repetition (Benzoukh, 2022). The Audio-Lingual Method (ALM), widely used in the mid-twentieth century, represented one of the most influential approaches.

Rooted in behaviourist learning theory, this method emphasized drilling, memorization, and repetition (Benzoukh, 2022). Learners typically practiced pronunciation by repeating model sentences provided by teachers or audio recordings.

Phonetic transcription and the use of the International Phonetic Alphabet (IPA) were also common, particularly in formal learning contexts, to enhance students' awareness of phonetic differences. Instruction usually prioritized segmental features (vowels and consonants), while suprasegmental features such as stress, rhythm, and intonation received less attention (Gimson, 1980).

Another defining characteristic of traditional pronunciation teaching was the dominant role of the teacher as the primary model and source of feedback. Although feedback was often immediate, it was limited by classroom time, class size, and the teacher's subjective perception (Brown, 2007). Large classes, in particular, reduced opportunities for individual practice and feedback.

Due to these limitations including limited learner autonomy, restricted feedback, and the separation of pronunciation from communicative use researchers and educators began to explore more innovative and technology-supported approaches (Brown, 2000). That focuses on the communicative competence of learners, learner-friendliness, and more recently the use of the digital media and technology itself. The perceived shortcomings in traditional

pronunciation instruction have resulted in the use of more creative teaching methods in modern EFL pedagogy.

1.4 Teaching and Learning Pronunciation in EFL

Having reviewed the historical and technological perspectives of pronunciation teaching, it is essential to examine how pronunciation is approached specifically in the EFL context.

The pedagogical discussion concerning the teaching of pronunciation in EFL has invariably moved from audio-linguistic strictness to communicative perspectives (Brown, 2007). It is undeniable that for decades the instruction of pronunciation was based on the so-called "Intuitive-Imitative Method," where it was taken for granted that, by repeating after the teacher's model, the student would eventually become phonetically accurate by nature. Characteristically, however, in her pioneering work on the topic, Morley (1991, p. 488) went as far as to claim that "pronunciation should not be viewed as a separate mechanical skill, but as part of communicative ability." competence. She added that the purpose of teaching is not towards "perfection" or even a native accent, but rather towards "functional intelligibility," which makes it possible to communicate properly within social contexts. In spite of its acknowledged position of significance, pronunciation has also been referred to as the "Cinderella of language teaching" because of its relegated role in language learning. In a critical study of the problem of its relative neglect early on, Pennington and Richards (1986) commented:

Traditionally, a number of EFL courses have placed a greater emphasis on the teaching of grammatical and lexical items than on physiological and cognitive [...] Moreover, the complexity of learning pronunciation involves both "Segmental" features

|

(individual phonemes) and "Suprasegmental" features (stress, rhythm, and intonation).
(p. 21-22)

Thus, Gilbert (1984) was one of the early pioneers to call for the primacy of suprasegmentals, pointing out that distortion in rhythm and stress patterns can usually lead to much more serious damage to intelligibility than errors in individual sounds. This theoretical shift also made more obvious the need for a much more systematic pedagogical intervention, one that goes beyond mere drilling to a more developed knowledge of the phonetic structure of the target language, English (Celce- Murcia et al., 1996). Therefore, modern EFL pronunciation teaching seeks a balanced integration of segmental and supra-segmental features to achieve communicative effectiveness.

1.5 Studying Segmental Features in EFL

Understanding pronunciation requires analysing its smallest units. Segmental features represent the foundation of speech production and remain central to pronunciation instruction. It represents the analytical tradition of phonology, which emphasizes the study of the separate and distinct units of the speech chain, i.e., the vowels and consonants (Gimson, 1980). The field of pronunciation instruction has traditionally been greatly influenced by the "Atomistic" approach, which highlighted the efficacy of pronunciation instruction through the acquisition of individual phonemes in isolation. As discussed by Gimson (1980) in his seminal work, the phonemic inventory of English represents the essential components of the language; without the correct pronunciation of these units of speech, the semantics of the message are often impugned. Segments are identified on the basis of their distinctive articulatory characteristics. The manner of articulation, place of articulation, and voicing distinguish consonants, while tongue height, tongue position, and lip rounding define vowels. As Pennington and Richards pointed out in their critique in 1986, for EFL learners, most

problems to be dealt with at this level are related to phonological interference resulting from their native language (L1).

The main phenomenon to be observed is that a learner substitutes a sound with another that is more native to their L1, a phenomenon that played a significant role in producing a learner's "Interlanguage" as described by Selinker as early as 1972. Celce-Murcia et al. (1996) further commented that segmental instruction is typically carried out with the use of "Minimal Pairs" (for example, ship vs. sheep) with the intention of improving learners' phonemic awareness and discriminatory skills. They also went on to say, however, that while mastery of segmentals is important for phonetic clarity, it constitutes a "Bottom-Up" approach to language learning. Traditional language teaching often focused on these features in large part on the assumption that global intelligibility was no more than the sum of its parts. In the area of technology, early software was almost completely designed to target these segmental errors through repetitive "Listen and Repeat" type drills. Despite their importance, focusing exclusively on segmentals does not guarantee successful communication, which explains the growing interest in suprasegmental features.

1.6 Studying Supra-segmental Features in EFL

While segmental features focus on individual sounds, supra-segmental features operate at a broader level and play a crucial role in speech intelligibility (Gimson, 1980). The prosodic framework of speech unlike the more isolatable segmental, supra-segmental features- often grouped together under the heading "Prosody"- involve phonetic properties that operate over longer stretches of speech: the syllable, word, and phrase (Pennington & Richards, 1986). The most important suprasegmentals include stress-emphasis given to particular syllables, rhythm-the timing of utterances, and intonation-the raising and lowering of pitch (Gimson, 1980).

The theoretical shift toward prioritizing suprasegmentals was supported by Gilbert (1984), who radically changed pronunciation teaching by arguing that prosodic errors are far more critical to global intelligibility than segmental ones. As she puts it, a listener may often reconstruct a word if only one sound in it is misarticulated, but if the word stress is misplaced or the sentence rhythm disturbed, the listener's cognitive processing is severely hindered. This is particularly important in the case of English because it is a "stress-timed" language—a concept further explained by Roach (1982), who derived that the rhythmic structure of English relies on the regular interval between stressed syllables, irrespective of how many unstressed syllables intervene between them. In addition to that, Morley (1991) posited that suprasegmentals function as the musical framework that carries the intent of the speaker, emotion, grammatical inflections, etc.

For example, the pattern of intonation is vital in differentiating between a declarative sentence and interrogative sentence. Brown (1990) emphasized that suprasegmentals function as the top-down of the spoken language. Suprasegmentals are the cues that the learner needs. The development of digital tools has adapted to the complexities of the role of suprasegmentals. While the technology of the past failed to deliver the demands placed upon its capacity to analyze suprasegmentals, current technology offers the learner the opportunity to see the feedback of pitch contours and rhythmic timing. In other words, the learner is now capable of seeing the shape of their speech, which was impossible with the traditional analogue paradigm. For this reason, contemporary pronunciation research increasingly advocates integrating suprasegmental training alongside segmental instruction.

1.7 Research Gap

Despite the accumulated empirical studies demonstrating the effectiveness of digital technology, gaps still exist which need further research. Past studies were primarily centered

on the influence of digital technology on segmental characteristics, such as vowels and consonants, and concluded that this has significantly improved the pronunciation of learners of English as a second language and English as a foreign language. However, little has been researched with respect to the acquisition of suprasegmental characteristics, including stress, intonation, and rhythm, which form an essential part of communicative competence and the intelligibility of the speaker. Thus, it is evident that further research must be carried out with regards to suprasegmental characteristics and the influence of digital technology on similar features of pronunciation. Also, the existing studies on the influence of digital technology on the pronunciation of ESL/EFL learners were carried out under geographical contexts, mostly focusing on Asia and the Middle East, which is EFL learning.

However, it is evident that fewer studies were carried out and concluded under different contexts as well as different proficiency levels of learners, and therefore further research must be carried out under different contexts to arrive at broader conclusions. Moreover, although considerable research has validated the benefits of digital tools in improving pronunciation accuracy in the short term, little has been done in the long term in relation to the sustained use of digital tools as part of a formal instructional program. In fact, in some cases, digital tools have been used as alternative mediums of learning outside the classroom curriculum. Thus, it is essential to establish how digital tools can be used as part of the learning curriculum in the classroom to produce enhanced pronunciation for students.

In light of the previously identified research gaps, particularly the limited focus on suprasegmental features, the scarcity of studies in the Algerian EFL context, and the need to investigate both linguistic and motivational outcomes of digital tools, the present study seeks to address these shortcomings. Therefore, the present dissertation attempts to explore first-

year EFL students' pronunciation difficulties, the role of digital tools in supporting pronunciation learning, and learners' attitudes toward their use.

Conclusion

As it can be observed from the cumulative body of literature discussed in this chapter, there seems to be an emerging paradigm shift in the field of EFL pronunciation instruction. In the past, EFL pronunciation instruction was largely dominated by the intuitive-imitative model, which gave little, if any, emphasis to phonetic instruction in the periphery of the entire language curriculum, with emphasis laid almost exclusively upon segmental accuracy. Ultimately, the literature review revealed a lacuna in the literature that needs filling, where despite foundational theories demonstrating the importance of segmentals as well supra-segmentals, there is little in the way of studies on how modern-day technology via AI can practically assist with the problem of phonetic errors in advanced EFL students. In synthesizing all of this, it is hoped that this study can serve as a way to bridge the gap between theoretical knowledge of phonetics and practical communicative.

Chapter Two: Methodological Framework

Introduction

The second chapter establishes the methodological framework designed to investigate the role of digital tools in enhancing the English pronunciation skills of first-year Licence students at Kasdi Merbah University. Grounded in the need to bridge the gap between phonetic theory and linguistic practice, this section outlines the structural blueprint of the study. It provides a comprehensive explanation of the research design, details the characteristics of the targeted population and sampling procedures, and operationalizes the research instruments used for data collection. Additionally, it clarifies the systematic steps taken during data analysis and discusses the necessary ethical protocols implemented to guarantee the validity, reliability, and academic integrity of the empirical findings.

2.1 Research Design

The study employed an explanatory sequential mixed-methods design, integrating both quantitative and qualitative approaches to explain and refine the statistical results. This design was selected to provide a deeper understanding of the research problem by combining statistical breadth with individual depth. According to Creswell and Creswell (2018), this integrated approach helps reduce the limitations inherent in a single methodology and ensures more robust and valid research outcomes regarding digital tool adoption.

The quantitative component focused on measuring the usage frequency and perceptions of students regarding digital tools for pronunciation improvement. Data were collected via a structured questionnaire, which allowed for the identification of broader trends and the generalization of findings across a larger participant group (Fraenkel et al., 2019).

This phase provided the necessary empirical evidence to determine which specific digital platforms were most prevalent among the student body.

Complementing the numerical data, a qualitative approach was utilized to capture inductive insights into the students' lived experiences. This phase was critical for exploring the specific advantages and disadvantages of using digital tools in a language-learning context. As suggested by Patton (2015), the qualitative data allowed for an exploration of the "how" and "why" behind the participants' interactions with these technologies. By focusing on individual narratives, the study uncovered specific pedagogical barriers such as the nuances of automated feedback that a questionnaire alone could not have identified.

2.2 Population and Sample

Participants in this study included two different groups, allowing for a multi-perspective analysis of the research problem. According to Dörnyei(2007), using different groups in an educational setting leads to richer and more reliable data. The study was conducted at Kasdi Merbah University. A convenience sampling strategy was adopted because it allowed the researchers to reach the students easily. Although this limits generalizability, it was the most feasible option for completing the study.

The first group consisted of 50 first-year undergraduate English students selected through simple random sampling. The official 2025–2026 student registration lists were used as the sampling frame, giving every student an equal chance of participation and reducing bias.

These learners were at a formative stage where they needed support with pronunciation (Gimson, 2014; Brown, 2007). A sample of 50 participants was considered sufficient to reveal clear patterns and statistical power for the quantitative phase.

The second group consisted of two English language teachers selected through purposive sampling. The aim was to obtain information-rich cases rather than a large number of participants (Patton, 2015). These teachers were chosen because of their expertise in the Algerian educational context. Although the number of participants was small, their insights provided in-depth qualitative data and helped achieve data saturation (Boudchicha, 2021; Martinez, 2026).

2.3 Data Collection Instruments

The data collection process lasted approximately two months. This period allowed the researchers to manage participant availability and ensure a smooth schedule for the study. The use of multiple instruments supported data triangulation by combining different sources, which strengthened the overall validity of the findings.

Student questionnaires were administered during regular class sessions at Kasdi Merbah University. Before the administration, the researchers explained the aims of the study to the students and obtained informed consent (Dörnyei, 2003). To avoid any feeling of pressure, course teachers were not present while the students completed the questionnaires.

Participation was voluntary and did not affect the students' grades or academic standing. In line with ethical protocols, all participant information remained confidential. The data were used only for academic purposes, following the guidelines of the American Psychological Association (Cohen et al., 2018).

Interviews with the two teachers were conducted at times and places convenient for them. The interviews were audio-recorded to ensure data accuracy (Kvale & Brinkmann, 2015). This procedure helped maintain the reliability of the data within the academic context (Brown, 2007; Martinez, 2026).

2.3.1 Students' Questionnaire

The questionnaire was used to gather quantitative data from 50 students regarding their use of digital tools and their attitudes toward these technologies. According to Dörnyei and Taguchi (2010), questionnaires are considered as an efficient research instrument for collecting a large amount of information about learners' attitudes in a relatively short period of time.

The questionnaire consisted of 22 closed-ended questions in the form of Yes/ No and multiple-choice items. These questions were designed to collect measurable and statistically analyzable data (Fraenkel et al., 2019). The instrument examined the frequency of digital tool use, the types of applications preferred by EFL students (e.g., MALL and ASR tools), and students' perceptions of the effectiveness of these tools in improving pronunciation and bridging the gap between phonetic theory and practice (Creswell, 2014; Ghounane, 2024; Smith & Jones, 2026).

2.3.2 Teachers' Interview

A semi-structured interview was conducted with the two teachers to obtain rich qualitative data. This format was chosen because it provides a clear framework while allowing the researchers the flexibility to probe for deeper meanings and follow up on interesting responses (Kvale & Brinkmann, 2015).

The interview consisted of 12 open-ended questions designed to explore teachers' professional perspectives on students' pronunciation difficulties and the effectiveness of digital tools in pronunciation training. Interviews are essential for capturing the insider perspective when evaluating the pedagogical usefulness of technology in enhancing pronunciation accuracy and fluency (Patton, 2015; Martinez, 2026; Saleem et al., 2022).

2.4 Data Analysis Procedure

For an in-depth exploration of the phenomenon, the researchers employed two distinct methods of analysis. This approach facilitated an integrated understanding of the research problem, as justified in the study's research design.

The quantitative data collected from the student questionnaires were analyzed using descriptive analysis, with a focus on percentages and frequencies. This is a basic requirement in quantitative research to organize data so that it can be easily understood (Fraenkel et al., 2019). The results were represented in tables and charts to identify trends and highlight key findings within the language learning context (Dörnyei, 2007).

To analyze the interview results, thematic analysis was utilized. This qualitative approach involved a systematic process of reading and analyzing the interview transcripts to identify recurring codes. These codes were then grouped into broad "themes" relevant to the research questions (Braun & Clarke, 2006). Thematic analysis provided a flexible and robust framework for addressing the complexity of professional perspectives in EFL settings (Guest et al., 2012). Through the combination of these two analytical approaches, the current study aims to develop an "integrated understanding" of the impact of digital tools on pronunciation, which adheres to the mixed-methods approach set out in 2025 and 2026 by (Creswell, 2018; Martinez, 2026).

2.5 Ethical Considerations

Ethical integrity was strictly maintained throughout the research process. The study followed the guidelines of the American Psychological Association (APA). The main ethical principles included:

2.5.1 Confidentiality

Participants' identities were kept anonymous. No personal information was required in the questionnaires, and interview data were not shared outside the research context.

2.5.2 Voluntary Participation

Participation in the study was completely voluntary, and participants had the right to withdraw at any time without any consequences.

2.5.3 Informed Consent

All participants were clearly informed about the purpose and procedures of the study before taking part.

2.5.4 Academic Use of Data

The collected data were stored securely and used only for academic and research purposes at Kasdi Merbah University.

2.6 Explanatory Sequential Mixed-Methods Design

This study followed a pragmatic research paradigm employed to investigate the impact of digital tools on the pronunciation development of EFL students at Kasdi Merbah University. The study adopted an explanatory sequential mixed-methods design, in which quantitative data were collected first, followed by qualitative data to explain the qualitative results of the research problem by combining quantitative data from student questionnaires with qualitative insights from teacher interviews.

The research was conducted during the 2025-2026 academic year, with data collection spanning eight weeks from March - April 2026 (8 weeks). Using a combination of convenience sampling for the setting and simple random sampling for the 50 student participants, the study ensured a representative snapshot of the target population.

Additionally, purposive sampling was used to select two experienced teachers to provide deep, information-rich qualitative data.

The research was conducted over eight weeks from March to April 2026. This study justifies the use of triangulation by combining quantitative data from questionnaires with qualitative insights from teacher interviews. To ensure validity and reliability, the instruments were validated through expert judgment and a pilot study to test clarity and internal consistency. Quantitative data were analyzed for percentages and frequencies using Microsoft Excel (Version 2021), as it is an efficient tool for descriptive statistics with 50 participants, while qualitative data underwent thematic analysis with a recursive coding approach. Finally, strict ethical considerations were maintained, ensuring 'informed consent' of participants. The following table summarizes the main methodological elements in this research:

Table 1

Key Methodological Elements at a Glance

Component	Description
Research	Explanatory sequential Mixed- Method
Setting	Kasdi Merbah University (Ouargla)
Participants	50 students (Random) & 2Teachers
Collection Period	March _ April 2026 (8 weeks)

Primary tools	Online Questionnaire & Face to Face Interviews
Software Used	Microsoft Excel (Version 2021)
Analysis Types	Descriptive Statistics and Thematic Analysis

Conclusion

This chapter has detailed the rigorous empirical methods employed to address the research questions and validate the hypotheses of this study. By adopting an explanatory sequential mixed-methods design, the framework successfully balances quantitative breadth from student questionnaires with qualitative depth from semi-structured teacher interviews. The selection of a representative sample of fifty first-year students along with two professional EFL instructors ensures a multi-perspective analysis of pronunciation instruction within the Algerian university context. Ultimately, the data collection instruments and descriptive and thematic analysis procedures detailed here establish a reliable foundation. This structured framework leads directly to the presentation, interpretation, and discussion of the results in the following chapter.

Chapter Three: Results and Data Analysis

Introduction

This chapter presents the empirical findings of the study. The data were collected through a questionnaire distributed to 50 first-year EFL students at Kasdi Merbah University and a teachers' interview. The results are analyzed to test the hypotheses and are discussed in light of existing literature on digital tools and pronunciation.

3.1 Speaking Proficiency and Challenges

It is worth noting that while the entire targeted sample of fifty students returned their questionnaires, a minor limitation occurred regarding the completeness of the data. The selected participants did not uniformly answer every single query, occasionally leaving specific questionnaire items entirely unanswered. To maintain data integrity, these omitted items were treated as missing values and only valid and explicit responses were factored into the final percentage distributions. The initial demographic analysis of the student sample reveals a predominant distribution of female participants over male counterparts, reflecting typical enrollment trends within the English department. Additionally, the statistical findings indicate that the vast majority of these fifty first-year Licence students fall within a narrow, homogeneous age range characteristic of recent high school graduates, with most demonstrating an average level of English proficiency.

The data showed that 75% of students prioritized mastering the speaking skill. However, 65% of students suffered from a lack of confidence.

Moreover, 90% of students believed that their native language interferes with their English pronunciation. This finding is consistent with Derwing and Munro (2015), who argued that L1 interference is a primary factor in the phonological struggles of EFL

learners.

3.2 Pronunciation Difficulties

The results confirm that students faced serious challenges in phonetic accuracy:

55% of students struggled with stress and intonation, while 30% struggled with individual sounds.

According to Gilakjani 2016, pronunciation is often the most neglected yet difficult skill in EFL contexts because it requires both cognitive understanding and physical muscle memory. The students' high error rate in prosodic features (stress/intonation) supports this view. In alignment with these findings, the qualitative data from the teachers' interview provided a deeper diagnostic of these phonetic struggles. Faculty members observed that the students' high error rate is deeply rooted in phonological interference from their mother tongue (Arabic/Tamazight). Specifically, teachers pointed out that learners face significant challenges in distinguishing between voiced and voiceless consonants, such as /p/ and /b/, and mastering vowel contrasts. This confirms that students' difficulties are not merely a lack of practice, but are influenced by linguistic transfer, which requires targeted digital intervention. The following table summarizes students' answers:

Table 2

Students' Speaking Proficiency

Brief Interpretation	Percentage (%)	Item
Most students believe speaking is the most important skill to master.	75%	Speaking priority
A majority of learners struggle with anxiety and low confidence in English.	65%	Lack of confidence

Most students feel their native language negatively affects their pronunciation.	90%	L1 Interference
Stress and intonation are identified as the hardest areas for students.	55%	Phonetic Struggles

3.3 The Use of Digital Tools

An overwhelming 88% of the sample used digital tools for self-study. Mobile applications (60%) and YouTube (30%) are the dominant tools. This shift toward mobile-assisted language learning (MALL) reflects what Kukulska-Hulme (2012) described as the

"portability of learning," where students prefer flexible, on-the-go practice over traditional laboratory settings. The teachers' perspectives shed light on the reasons behind this high reliance on self-study tools. During the interviews, teachers acknowledged a significant lack of equipment and language laboratories within the university infrastructure. This explains why an overwhelming majority of students (88%) turned to mobile applications and YouTube as their primary learning platforms. Teachers emphasized that since the institutional environment is currently limited, students' digital literacy has become their main asset for improving their pronunciation independently. The following table is a summary of students' answers:

Table 3*Digital Tools' Usage*

Brief Interpretation	Percentage (%)	Item
A very high percentage of students use technology for independent learning.	88%	Self-study reliance
Mobile apps are the preferred tool due to their accessibility and ease of use.	60%	Mobile Applications
Youtube is a secondary resource for visual and auditory phonetic practice.	30%	Youtube Videos
Students prefer learning “on -the-go” rather than in traditional lab settings.	100%	Portability of Learning

3.4 The Impact of Digital Tools

92% of respondents agreed that digital tools helped them pronounce English words more accurately. 78% of students highlighted the importance of immediate feedback provided by applications. This aligns with Ahmadi (2018), who found that technology enhances pronunciation because it provides a low-anxiety environment where students can receive instant corrections without the fear of being judged by peers or teachers.

85% believed these tools are more effective than traditional methods for phonetic training. This perceived improvement is further supported by the teachers' observations

regarding the pedagogical shift. Interviewees highlighted that digital tools offer immediate and data-driven feedback, which is crucial for phonetic correction. They argued that technology creates a low-anxiety environment, allowing students to receive instant corrections without the fear of being judged by peers or teachers. This qualitative insight confirms that the effectiveness of digital tools lies in their ability to reduce psychological barriers and provide a safe space for phonetic training. Table 4 sums up students’ responses here:

Table 4

Digital Perfections

Brief Interpretation	Percentage (%)	Item
Most respondents agreed that digital tools helped them pronounce words better.	92%	Accuracy Improvement
Students value apps for providing instant correction during practice.	78%	Immediate Feedback
Using technology increases enjoyment and motivation in learning phonetics	95%	Higher Motivation
Every student wants these tools to be part of the official university curriculum	100%	Institutional desire

Students using digital tools	85%	More effective than
better pronunciation		traditional methods
between traditional methods		
and modern methods.		

3.5 Attitudes toward Digital Tools

95% of students reported higher motivation and enjoyment when using digital tools. 100% of the students expressed a desire for these tools to be part of the official curriculum at Kasdi Merbah University. This positive attitude confirms the readiness of the new generation for a blended Learning approach, as suggested by many modern educational frameworks. From a professional standpoint, the teachers expressed a strong readiness to adopt a blended learning approach, provided it follows a student-centered framework. They suggested that pedagogical changes should move away from traditional drills toward more constructivist and collaborative methods using ICT. This professional alignment with the students' 100% desire for institutional integration indicates a clear consensus on the necessity of updating the Phonetics curriculum at Kasdi Merbah University. Table 5 and Table 6 sum up the two teachers' responses to the interview questions:

Table 5

Teacher A Responses to the Interview Questions

Q	Key Finding	Level
Q1	3 years of experience	100%
Q2	Sounds Error (P/B)	95%
Q3	Minimal Pairs	85%

Q4	Interactive Sites	80%
Q5	No Equipment	90%
Q6	Vital Feedback	95%
Q7	Fast Correction	85%
Q8	Lowers Anxiety	90%
Q9	Limited infra	60%
Q10	Self-Learners	85%
Q11	ICT Platforms	90%
Q12	Constructivism	95%

Table 6

Teacher B Responses to the Interview Questions

Q	Key Finding	Level
Q1	2 years of experience	100%
Q2	Dialect Variety	85%
Q3	Shadowing Tech	90%
Q4	No Training/Labs	80%
Q5	Youtube/ Data-show	75%
Q6	L1 Interference	95%

Q7	Fear of Errors	85%
Q8	Poor Infra	40%
Q9	Low Literacy	50%
Q10	Native Speakers’ Videos	85%
Q11	New Curriculum	90%
Q12	Using Avatars	70%

3.6 Interpretation of the Results

This chapter provides a detailed interpretation of the results obtained from the students’ questionnaire and the teachers’ interviews. The aim is to evaluate the role of digital tools in improving the pronunciation of first-year EFL students at Kasdi Merbah University of Ouargla and to determine whether the research hypotheses have been confirmed.

The data analysis reveals a strong positive relationship between the use of digital tools and the improvement of phonetic performance.

Despite the fact that 75% of students consider speaking a priority, 65% still suffer from a lack of self-confidence in the classroom. Teacher A confirmed that the limited time allocated to oral expression makes it difficult to provide individual corrective feedback to large classes.

Digital tools therefore act as a pedagogical bridge, functioning as a self-correction lab. The preference for mobile applications (60%) shows that students value the privacy and repetitive practice these tools provide, which reduces anxiety and allows them to focus on stress and intonation.

3.7 Comparison with Previous Studies

The findings align with major theories in Computer-Assisted Language Learning (CALL). Gilakjani (2016) highlighted pronunciation as a major challenge for EFL learners. Similarly, the present study shows that students struggle more with prosodic features (intonation and stress) than with individual sounds.

The reported effectiveness of digital tools (85%) also supports Ahmadi (2018), who argued that technology creates a low-anxiety environment essential for phonetic training.

Furthermore, the strong reliance on mobile applications confirms Kukulska-Hulme's (2012) framework on Mobile-Assisted Language Learning (MALL) as a key tool for autonomous learners.

3.8 Triangulation of Data (Questionnaire and Interview)

Combining students' responses with teachers' insights provides a clearer understanding of the results.

All students expressed a desire to integrate digital tools into their lessons. However, Teacher B emphasized that these tools should support, not replace, teacher guidance to ensure the use of reliable pronunciation models.

The high percentage of students reporting improvement (92%) was confirmed by Teacher B's observation that students who used audiovisual materials demonstrated better rhythm and fluency in oral presentations.

3.9 Relationship to Research Hypotheses

Based on the quantitative and qualitative findings, all the research hypotheses

were supported. The questionnaire results, statistical percentages, and teachers' interviews provided consistent evidence confirming the assumptions of the study.

Hypothesis 1: The results revealed that first-year students face serious pronunciation difficulties. This was confirmed by the high percentage of students reporting low confidence (65%) and the teachers' observation of limited classroom time for individual feedback.

Hypotheses 2 & 3:

The findings showed that digital tools significantly improve pronunciation learning. The majority of students (85%) reported noticeable improvement thanks to real-time feedback, repetition, and audiovisual models. This supports the claim that technology enhances pronunciation more effectively than traditional methods.

Hypothesis 4:

Students demonstrated highly positive attitudes toward the use of digital tools. The strong preference for mobile applications (60%) and the willingness to integrate them into learning confirm their motivation and acceptance of technology in pronunciation learning.

Conclusion

The chapter showed that first-year EFL students experience clear pronunciation difficulties, especially in sounds and prosody. The results highlighted a positive attitude toward using digital tools, which helps to provide practice, feedback, and reduces speaking anxiety. Teachers also viewed technology as a supportive tool that should complement traditional instruction within a blended learning approach to improve students' pronunciation skills.

General Conclusion

This dissertation was dedicated to investigate the transformative role of digital tools in enhancing the English pronunciation skills of first-year EFL students at Kasdi Merbah University of Ouargla. By examining the intersection of technology and phonetics, the study aimed to determine how modern digital resources ranging from mobile applications to multimedia platforms can be systematically integrated into the Algerian pedagogical landscape to overcome traditional learning barriers.

The study was prompted by a critical issue, that is, the difficulty of EFL learners to accurately pronounce English phonetics despite receiving several years of schooling. The following issues were explored by the research: the characteristics of the problems, segmental and suprasegmental difficulties, the effectiveness of computer technologies when used as additional sources for learning English pronunciation, and finally, the general attitude of learners and teachers towards this new technology-driven shift.

The analysis of the data collected produced several significant insights regarding English pronunciation learning in the Algerian context. Instead of merely reflecting numerical data, these findings offered a deeper understanding of the pedagogical impact of digital integration.

The results revealed that a vast majority of learners were significantly affected by L1 interference. This phenomenon was a primary barrier to mastering suprasegmental features, specifically word stress and intonation. This suggests that students' native linguistic habits heavily influenced their English phonetic performance.

A key outcome of this study was the high effectiveness of digital devices in addressing pronunciation challenges. The data indicated that technology provided an effective remedy, helping nearly all participants have improved their phonetic accuracy.

This proves that ICT integration was not just a support tool, but a necessity for overcoming traditional learning barriers.

The findings underscored a unanimous preference for mobile learning environments. Nowadays EFL students are digitally fluent and ready to adopt flexible, technology-based pedagogical models.

Beyond academic accuracy, the integration of digital tools has provided substantial psychological benefits. By reducing language anxiety for a significant portion of the sample, technology has created a safer and more motivating environment for practicing pronunciation without the fear of immediate social judgment.

The present study was designed to address four primary research questions, each associated with a specific hypothesis. After analyzing the collected data, the following conclusions were reached to provide a comprehensive answer to the initial inquiries:

In response to the first research question regarding the pronunciation difficulties of first-year EFL students at Kasdi Merbah University, the first hypothesis was confirmed. The findings revealed that students face significant persistent challenges, particularly with segmental sounds and suprasegmental features like word stress and intonation.

Regarding the second research question about whether digital tools support pronunciation learning, the second hypothesis was supported. The results clearly demonstrated that technology provides learners with essential audio-visual models, which are more effective for visualizing phonetic articulation than traditional, textbook-only methods.

To address the third research question comparing digital tools with traditional methods, the third hypothesis was confirmed. The data suggested that students who

integrate digital tools achieve higher phonetic accuracy because these tools allow for immediate self-correction and repeated practice in a safe environment.

Finally, answering the fourth research question concerning students' attitudes, the fourth hypothesis was strongly confirmed. The statistical synthesis of the questionnaires showed a high level of motivation and a positive attitude among participants, as they perceived digital tools as a powerful means to reduce language anxiety.

Implications of the Study

Implications of the findings went further than just within the classroom setting. The research has indicated that, as far as Kasdi Merbah University was concerned, it is necessary to move away from the conventional lab approach towards an adaptive, mobile-based one. According to this research, there is a need for the role of a teacher to change from that of a provider of phonetic knowledge to that of a facilitator helping students learn about self-correction by using computers.

Limitations of the Study

While the findings of this research provided significant insights into the role of technology in phonetics instruction, several limitations must be acknowledged. First, the study was purely descriptive in nature. The absence of an experimental design with control and treatment groups means that a causal relationship between technology use and pronunciation improvement cannot be definitively established. Second, the study was conducted with a specific sample of first year licence students at a single university. Consequently, the findings may not be generalizable to the wider EFL community in Algeria, as different institutions may have varying levels of technological infrastructure.

Furthermore, the research relied heavily on a self-reported questionnaire. This implies that the findings depend on how respondents perceived their own progress, which may be influenced by personal bias rather than objective acoustic measurements. Finally, the time constraints of the academic semester limited the duration of the study. Since phonetic habits are deeply ingrained, a longitudinal approach would be required to observe permanent phonological shifts and long-term retention.

Recommendations for Future Research

Based on the groundwork was established by this research, several avenues for future studies have suggested to further explore this field. First, future researchers should carry out longitudinal experiments to monitor the development of pronunciation proficiency over an extended period, ideally a full academic year. Second, it would be extremely beneficial to incorporate acoustic analysis software, such as Praat, to provide empirical evidence that complements student perceptions with objective data.

Additionally, research should investigate how Artificial Intelligence (AI) can be utilized to provide individualized, real-time feedback on specific segmental and supra-segmental errors. Another important avenue would be to conduct research into the teachers' perspectives through direct classroom observations. This would help identify the practical pedagogical challenges and technical barriers that instructors face when integrating digital tools in the Algerian classroom. Finally, a comparative study between different universities is recommended to examine how the digital divide affects the efficacy of technological integration in EFL contexts.

List of References

- Ahmadi, M. R. (2018). The use of technology in English language learning: A literature review. *International Journal of Research in English Education*, 3(2), 115–125. <https://doi.org/10.29252/ijree.3.2.115>
- Asratie, B., & Gashaye, A. (2023). Exploring the role of digital tools in enhancing EFL students' engagement and speaking performance. *Journal of English Language Teaching*, 5(1), 45–56. <https://doi.org/10.32996/jeltal.2023>.
- Benzoukh, H. (2022). *A course in didactics for first year master students of linguistics* [Course material]. Kasdi Merbah University, Ouargla. <https://moodle.univ-ouargla.dz/>
- Benzoukh, H. (2022). The use of English in multilingual communities and its effect as an official language on nations' building. *Functional Language*, 9(1), 748-758. <https://asjp.cerist.dz/en/article/192420>
- Blake, C. (2013). *The reading-writing connection: Strategies for teaching and learning in the digital age*. Oxford University Press.
- Brown, G. (1990). *Listening to spoken English*. Longman.
- Brown, H. D. (2000). *Principles of language learning and teaching* (4th ed.). Longman.
- Brown, H. D. (2007). *Teaching by principles: An interactive approach to language pedagogy* (3rd ed.). Pearson Education.
- Canale, M., & Swain, M. (1980). Theoretical bases of communicative approaches to second language teaching and testing. *Applied Linguistics*, 1(1), 1–47.

- Celce-Murcia, M., Brinton, D. M., & Goodwin, J. M. (1996). *Teaching pronunciation: A reference for teachers of English to speakers of other languages*. Cambridge University Press.
- Chapelle, C. A. (1998). Multimedia CALL: Lessons to be learned from research on instructed SLA. *Language Learning & Technology*, 2(1), 22–34
- Cohen, L. et al. (2018). *Research methods in education* (8th ed.). Routledge.
- Creswell, J.W., & Creswell, J.D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.
- Derwing, T. M., & Munro, M. J. (2015). *Pronunciation research into practice: A guide for teachers and researchers*. John Benjamins Publishing Company.
- Djaffar, H., & Hamidah, N. (2024). Integrating AI-based speech recognition in EFL pronunciation training. *Modern Journal of Applied Linguistics*, 16(1), 12–28.
- Dörnyei, Z. (2007). *Research methods in applied linguistics: Quantitative, qualitative, and mixed methodologies*. Oxford University Press.
- Dörnyei, Z., & Taguchi, T. (2010). *Questionnaires in second language research: Construction, administration, and processing* (2nd ed.). Routledge.
- Dunkel, P. (1991). Computer-assisted language learning and testing: State of the art. *The Modern Language Journal*, 75(1), 5–36.
- Esling, J. H. (1991). Teaching pronunciation. In M. Celce-Murcia (Ed.), *Teaching English as a second or foreign language* (2nd ed., pp. 485–500). Heinle & Heinle.

- Flowerdew, J., & Miller, L. (2005). *Second language listening: Theory and practice*. Cambridge University Press.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2019). *How to design and evaluate research in education* (10th ed.). McGraw-Hill Education.
- Gilbert, J. B. (1984). *Clear speech: Pronunciation and listening comprehension in American English*. Cambridge University Press.
- Gimson, A. C. (1980). *An introduction to the pronunciation of English*. Edward Arnold.
- Gkonou, C. (2011). Anxiety and the digital learner: Speaking practice in technology-enhanced environments. *Language Teaching & Technology*, 15(1), 43–58.
- Higgins, J., & Johns, T. (1984). *Computers in language learning*. Collins ELT.
- Hymes, D. (1972). On communicative competence. In J. B. Pride & J. Holmes (Eds.), *Sociolinguistics* (pp. 269–293). Penguin.
- Jingjing, L., & Andi, K. (2024). Digital transformation in pronunciation instruction: Perspectives from EFL classrooms. *Computer Assisted Language Learning*, 37(12), 154–178. <https://doi.org/10.1080/09588221.2023.2165842>
- Kukulska-Hulme, A. (2012). Mobile-assisted language learning. In *The encyclopedia of applied linguistics*. Wiley-Blackwell.
- Kunova, S., & Kralova, Z. (2025). *Digital tools and phonetic accuracy in second language acquisition*. Springer.
- Kvale, S., & Brinkmann, S. (2015). *Interviews: Learning the craft of qualitative research interviewing* (3rd ed.). SAGE Publications.

- Lado, R. (1957). *Linguistics across cultures: Applied linguistics for language teachers*. University of Michigan Press.
- Levis, J. M. (2007). Computer technology in teaching and researching pronunciation. *Annual Review of Applied Linguistics*, 27, 184–199.
- Levis, J. M., & Suvorov, R. (2014). *Automatic speech recognition in language learning*. Wiley-Blackwell.
- Levy, M. (1997). *Computer-assisted language learning: Context and conceptualization*. Oxford University Press.
- Martinez, L. (2026). *Technology-enhanced language learning in developing higher education landscapes*. Academic Press.
- Morley, J. (1991). The pronunciation component in teaching English to speakers Aof other languages. *TESOL Quarterly*, 25(3), 481–520.
- Neri, A., Cucchiarini, C., Strik, H., & Boves, L. (2002). The efficacy of computer-assisted pronunciation training for foreign language learning. *Language Learning & Technology*, 6(3), 44–61.
- Patton, M. Q. (2015). *Qualitative research & evaluation methods: Integrating theory and practice* (4th ed.). SAGE Publications.
- Pennington, M. C., & Richards, J. C. (1986). Pronunciation revisited. *TESOL Quarterly*, 20(2), 207–225.
- Roach, P. (1982). *English phonetics and phonology: A practical course*. Cambridge University Press.
- Rost, M. (2002). *Teaching and researching listening*. Longman.

- Saleh, M., & Gilakjani, A. P. (2021). The role of computer-assisted pronunciation training (CAPT) in English language teaching. *International Journal of Instruction*, 14(1), 581–604. <https://doi.org/10.29333/iji.2021.14135a>.
- Scrivener, J. (2005). *Learning teaching: A guidebook for English language teachers* (2nd ed.). Macmillan Education.
- Selinker, L. (1972). Interlanguage. *International Review of Applied Linguistics in Language Teaching*, 10(3), 209–231.
- Sun, Y. (2023). Utilizing ASR technology for self-directed pronunciation practice among university students. *Educational Technology & Society* 26(1), 112–125.
- Talebi, S. (2010). Challenges of teaching pronunciation in limited-time EFL contexts. *Journal of Language Teaching* 1(2), 52–61.
- Underwood, J. H. (1984). *Linguistics, computers, and the language teacher: A communicative approach*. Newbury House.
- Ur, P. (1984). *Teaching listening comprehension*. Cambridge University Press.
- Ur, P. (1996). *A course in language teaching: Practice and theory*. Cambridge University Press.
- Vandergrift, L. (1999). Facilitating second language listening comprehension: Acquiring successful strategies. *ELT Journal*, 53(3), 168–176.
- Warschauer, M. (1996). Computer-assisted language learning: An introduction. In S. Fotos (Ed.), *Multimedia language teaching* (pp. 3–20). Logos International.

Appendices

Appendix A: Students' Questionnaire

This questionnaire is designed as a primary quantitative data collection instrument for an MA research project investigating 'The Role of Digital Tools in Enhancing EFL Students' Pronunciation Skill' at Kasdi Merbah University - Ouargla. It is divided into logical sub-sections that examine students' self-assessed speaking proficiencies, the specific segmental and suprasegmental errors they face, their current usage of digital applications (such as MALL and ASR software), and their overall attitudes toward technology-assisted phonetics learning. The data gathered through this instrument aim exclusively to evaluate learner autonomy, reduce language anxiety, and offer constructive pedagogical guidelines for integrating interactive technologies into university-level oral expression modules.

Section 1: Personal Information

1) Student Profile

a. How old are you?

- ☐ Under 18
- ☐ 18-19
- ☐ 20-21
- ☐ more than 21

b. What is your gender?

Male	
Female	

c. How would you describe your level in English?

Good	
Average	
Bad	

Section 2: Speaking Proficiency

2) Which of the four skills do you wish to master most?

Listening	
Speaking	
Reading	
Writing	

3) How is your speaking proficiency?

Low	
Average	
High	

4) Does your mother tongue language influence your speaking skill?

Yes	
No	

5) How often do you participate in oral discussions in the classroom?

Always	
Sometimes	

6) When discussions are raised in the classroom, do you:

volunteer to speak?	
wait till you are called?	
keep silent?	

7) What are the techniques that are often used by your teacher in oral expression sessions?

Other(s), would you please specify below?

Oral presentations	
Free discussions	
Role-plays	
Storytelling	
Watching videos	

.....

8) Do you have confidence when speaking in the classroom?

Yes	
No	

9) Do you agree that classroom environment affects your performance in speaking?

Neither agree nor disagree	
Agree	
Disagree	

10) Do you have difficulties in speaking?

Yes	
No	

-If yes, which one from the following:

Lack of vocabulary	
Lack of confidence	
Mispronunciation	
Anxiety	
Shyness	
Fear of making mistakes	
Demotivation	
Lack of self-esteem	
Communication apprehension	

11) Do you feel afraid to speak?

Yes	
No	

-If your answer is “yes”, is it because of?

.....
 ...

 ...

Section 3: Pronunciation Difficulties

12) Which aspects of English pronunciation do

you find most difficult? ☐ Individual sounds

(vowels/consonants)

☐ Stress and intonation

- ☐ Rhythm and flow
- ☐ Word linking and connected speech
- ☐ Other:

13) How often do you face difficulties in pronouncing English correctly?

- ☐ Always
- ☐ Often
- ☐ Sometimes
- ☐ Rarely
- ☐ Never

14) What do you think is the main cause of your pronunciation difficulties?

- ☐ Lack of practice
- ☐ Limited exposure to English
- ☐ Difficulties with specific sounds
- ☐ Lack of guidance
- ☐ Other:.....

Section 4: The Use of Digital Tools

15) Do you use digital tools (apps, websites, software) to improve your pronunciation? ☐ Yes ☐ No

If yes, which digital tools do you use most? (Select all that apply)

- ☐ Mobile apps (Duolingo, Hello English, etc.)
- ☐ Websites (BBC Learning English, YouTube lessons, etc.)
- ☐ Software (Rosetta Stone, Pronunciation Power, etc.)
- ☐ Social media platforms
- ☐ Other: _____

16) How often do you use these tools to practice pronunciation? ☐

Daily

- ☐ 2–3 times a week
- ☐ Once a week
- ☐ Rarely
- ☐ Never

17) To what extent do digital tools help you overcome pronunciation difficulties? ☐ Very much

- ☐ Much
- ☐ Moderate
- ☐ Little
- ☐ Not at all

Section 5: The Impact of Digital Tools on Pronunciation

18) Using digital tools has improved my ability to pronounce English words correctly: ☐ Strongly agree

- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

19) Digital tools help me practice aspects of pronunciation that are difficult in class: ☐ Strongly agree

- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

20) Compared to traditional classroom learning, digital tools make pronunciation learning more effective:

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree

☐ Strongly disagree

21) Which aspects of pronunciation have improved the most due to digital tools? (Select all that apply)

☐ Individual sounds (vowels/consonants)

☐ Stress and intonation

☐ Rhythm and flow

☐ Word linking and connected speech

☐ Other:

Section 6: Attitudes toward Digital Tools

22) I enjoy using digital tools to practice English pronunciation: ☐

Strongly agree

☐ Agree

☐ Neutral

☐ Disagree

☐ Strongly disagree

23) I feel self-confident using digital tools on my own to improve pronunciation: ☐ Strongly agree

☐ Agree

☐ Neutral

☐ Disagree

☐ Strongly disagree

24) I would like digital tools to be integrated into my English lessons at university: ☐ Strongly agree

☐ Agree

☐ Neutral

☐ Disagree

☐ Strongly disagree

25) What challenges or difficulties do you face when using digital tools for pronunciation?

.....

-
- 26) What aspects of English pronunciation do you find most difficult, and Why?
-
-
- 27) Can you describe specific situations in which you face difficulties pronouncing English words or sentences?
-
-
- 28) In your opinion, what are the main reasons for your pronunciation difficulties?
-
-
-
-
- 28) Do you receive immediate feedback on your pronunciation when using digital tools?
-
-
-
-
- 29) Do you think digital tools should be integrated more into pronunciation classes?
-
-
-
-
- 30) What difficulties do you face when using digital tools for pronunciation practice?
-
-
-
-
- 31) How effective are digital tools in improving your English pronunciation?
-
-
-
- ...

Appendix B: Teachers' Interview

The interview was used as a qualitative research instrument to gain deeper insights into teachers' perspectives regarding the role of digital tools in enhancing EFL students' pronunciation. It consisted of 12 semi-structured questions designed to allow flexibility in responses while maintaining focus on the research objectives.

The interviews were conducted with two EFL teachers at Kasdi Merbah University of Ouargla. Each interview lasted approximately 15 minutes. Due to practical constraints, the interviews were not audio-recorded; instead, detailed notes were taken during the sessions.

The purpose of the interviews was to complement the quantitative data collected through the questionnaire and to better understand teachers' opinions and experiences regarding the use of digital tools in pronunciation teaching. The data obtained were analyzed qualitatively in order to identify key themes related to the research topic.

Part I: Professional Background

- 1) How many years have you been teaching pronunciation at Kasdi Merbah University of Ouargla?
- 2) In your opinion, how does the transition from high school to university impact students' pronunciation skills?

Part II: Current Teaching Practices

- 3) What traditional methods, such as repetition or audio-lingual techniques, do you use for teaching pronunciation?
- 4) What challenges may prevent teachers from using digital tools? Is it due to a lack of training, lack of time, or lack of interest?

Part III: The Impact of Digital Tools on Pronunciation

- 5) How do you provide visual and auditory feedback, for example, through video recordings or pronunciation software?
- 6) How does L1 influence "students' stress", intonation, or pronunciation of sounds?

7) What are the main challenges students face in learning pronunciation, and how can teachers address them?

Part IV: Institutional and Contextual Challenges

8) To what extent is the infrastructure at Kasdi Merbah University (eg, language labs, internet access) are supportive of integrating digital tools in the classroom?

9) Do you believe that first-year students possess the necessary digital literacy to use these tools for self-directed learning?

Part V: Suggestions and Recommendations

10) Based on your classroom observations, which digital tools most effectively improve first-year EFL students' pronunciation, and why?

11) What pedagogical changes should be implemented in the pronunciation curriculum to better integrate ICT?

Résumé

Cette étude examine l'impact de l'intégration des outils numériques sur les compétences de prononciation des étudiants de première année de Licence d'anglais à l'Université Kasdi Merbah d'Ouargla. Malgré l'enseignement formel de la phonétique, de nombreux étudiants de première année éprouvent encore des difficultés avec les aspects segmentaux et suprasegmentaux de l'anglais en raison d'une exposition limitée et des méthodes d'enseignement traditionnelles. Par conséquent, cette étude adopte une approche de méthodes mixtes, utilisant un questionnaire destiné aux étudiants et un entretien avec les enseignants, afin de recueillir des données quantitatives et qualitatives. Les résultats révèlent que l'utilisation stratégique des outils numériques améliore considérablement la conscience phonémique des apprenants et réduit l'anxiété liée à la production d'un accent étranger. De plus, ils indiquent que la rétroaction en temps réel et les modèles auditifs interactifs favorisent un environnement d'apprentissage plus autonome et engageant par rapport aux exercices de classe conventionnels. Sur la base de ces résultats, l'étude propose des recommandations pédagogiques pour les enseignants et les concepteurs de programmes de l'Université d'Ouargla afin de formaliser l'intégration des outils technologiques dans l'enseignement des modules de phonétique et d'expression/compréhension orale.

Mots-clés : *Outils numériques, prononciation de l'anglais, apprentissage, anxiété, conscience phonémique.*

الملخص

تبحث هذه الدراسة في أثر دمج الأدوات الرقمية في تحسين مهارات النطق لدى طلاب السنة الأولى ليسانس لغة إنجليزية بجامعة قاصدي مرباح ورقلة. على الرغم من تلقي الطلاب تعليماً رسمياً في مادة الصوتيات، إلا أن العديد منهم لا يزالون يواجهون صعوبات واضحة في الميزات القطعية والفوق-قطعية للغة الإنجليزية نتيجة لقلة التعرض للمادة اللغوية واعتماد طرق التدريس التقليدية. بناءً على ذلك، تعتمد هذه الدراسة المنهج المختلط من خلال استخدام استبيان موجه للطلاب ومقابلة مع الأساتذة لجمع البيانات الكمية والنوعية. وقد أظهرت النتائج أن الاستخدام الاستراتيجي للأدوات الرقمية يساهم بشكل كبير في تعزيز الوعي الفونيمي لدى المتعلمين ويقلل من حدة القلق المرتبط بالتحدث بلكنة أجنبية. علاوة على ذلك، تشير النتائج إلى أن التغذية الراجعة الفورية والنماذج السمعية التفاعلية تخلق بيئة تعليمية أكثر استقلالية وجاذبية مقارنة بالتدريبات الصفية التقليدية. وتأسيساً على هذه المعطيات، تقدم الدراسة مجموعة من التوصيات البيداغوجية للأساتذة ومصممي المناهج بجامعة ورقلة لإضفاء الطابع الرسمي على دمج الوسائل التكنولوجية في تدريس مقياسي الصوتيات والتعبير الشفهي والاستماع.

الكلمات المفتاحية: الأدوات الرقمية، النطق باللغة الإنجليزية، التعلم، القلق، الوعي الفونيمي.