ATU
PRESS

Document Type: Research Paper

On the Efficacy of Employing Translanguaging in Teaching Problematic Pronunciation Features to Iranian EFL Learners

Musa Nushi* ⃝iD
Associate Professor of TEFL, Shahid Beheshti University, Tehran, Iran

Parisa Zibaei
MA in TEFL, Shahid Beheshti University, Tehran, Iran

Mehran Hosseinkhani ⃝iD
MA in TEFL, Shahid Beheshti University, Tehran, Iran

Abstract

Pronunciation remains a persistent challenge for English as a foreign language (EFL) learners. This is particularly important in contexts where segmental/suprasegmental features differ from those of learners' first language. Translanguaging is widely recognized as a beneficial pedagogical approach in language education. It is defined as learners' strategic use of their full linguistic repertoire, including first and additional languages, to support meaning-making and learning. However, its application to pronunciation instruction has received limited empirical attention. This quasi-experimental mixed-methods study examined the effectiveness of translanguaging-based instruction in developing Iranian EFL learners' segmental/suprasegmental pronunciation features and explored participants' perceptions of this approach. Twenty upper-intermediate Iranian EFL students were assigned to the experimental and control groups. Over 27 instructional sessions, the experimental group received translanguaging-based pronunciation instruction, while the control group followed a communicative English-only approach. Data were collected through pretest–posttest pronunciation tasks, acoustic analysis using Praat, and semi-structured interviews, and they were analyzed using non-parametric statistical tests and thematic analysis. The quantitative results revealed significant improvements in several suprasegmental features, including linking, epenthesis, deletion, sentence stress, and word stress, whereas gains in segmental features were limited. Acoustic analysis indicated significant changes in F2 onset frequencies for the diphthongs /oʊ/ and /eɪ/. Qualitative findings showed that students perceived translanguaging as enhancing comprehension and reducing anxiety. They also reported it created a more supportive learning environment and varied in effectiveness across pronunciation features. Findings suggest translanguaging is particularly effective for suprasegmental pronunciation development and offers pedagogical value for creating a learner-centered EFL pronunciation instruction.

*****Corresponding author's email:** m_nushi@sbu.ac.ir

INTRODUCTION

Pronunciation is widely recognized as a core component of second language (L2) proficiency because even minor phonological deviations can substantially affect intelligibility and listener comprehension (Celce-Murcia et al., 2010; Crowther & Loewen, 2025). According to Gilakjani (2016), effective communication relies heavily on correct pronunciation, as does language acquisition. Empirical research demonstrates that accented speech—particularly inaccurate stress placement, vowel quality, or reduced forms—can lead to communication breakdowns and negative listener judgments, even when grammatical and lexical accuracy is high (Derwing & Munro, 2015; Munro & Derwing, 2015). Despite years of formal instruction, many English as a foreign language (EFL) learners continue to experience persistent pronunciation difficulties, even at advanced proficiency levels, influenced by differences between learners' first-language sound systems and English as well as by proficiency level, learning context, and linguistic background (Pawlak, 2025; Suzukida & Saito, 2022). For example, Persian-speaking students of English have been shown to struggle systematically with vowel contrasts (e.g., /iː/–/ɪ/), word stress, and connected-speech processes such as linking and reduction, which are largely absent or differently realized in Persian (Gilakjani, 2012). These difficulties are not merely technical; they have been associated with reduced speaking confidence, heightened anxiety, and fewer opportunities for sustained oral interaction (Derwing & Munro, 2015). Such findings illustrate the prevalence and communicative impact of pronunciation problems and underscore the need for instructional approaches that more effectively support learners' management of complex phonological features.

While a wide range of instructional approaches has been proposed, most pronunciation research and pedagogy have traditionally operated within predominantly monolingual instructional paradigms, offering limited insight into how learners' existing linguistic resources might be systematically leveraged. In contrast, translanguaging has recently emerged as a powerful

theoretical and pedagogical framework in language education, emphasizing the dynamic use of learners' full linguistic repertoires to support meaning-making and learning (Huang & Chalmers, 2023). In this context, Canagarajah (2011) defined translanguaging as the deployment of a speaker's full linguistic repertoire. As Williams (1996, p. 64) suggested, it is receiving "information through the medium of one language (e.g., English), and you use it yourself through the medium of the other language (e.g., Welsh). Before you can use that information successfully, you must have fully understood it."

Despite growing interest in translanguaging as an inclusive and cognitively supportive pedagogical approach, empirical research examining its application to pronunciation instruction remains scarce. Existing studies on translanguaging have primarily focused on grammar, vocabulary, reading, writing, or affective variables (e.g., Khonamri et al., 2022; Nazari & Karimpour, 2023), leaving pronunciation, particularly the combined development of segmental and suprasegmental features, largely underexplored. This gap is especially evident in EFL contexts such as Iran, where learners continue to experience persistent pronunciation difficulties due to phonological differences between Persian and English. Moreover, to the best of our knowledge, no study has employed mixed-methods designs that integrate perceptual ratings, acoustic analysis, and learners' perspectives. Addressing these gaps, the present study is grounded in the need to examine whether translanguaging-based instruction can facilitate pronunciation development in a principled and measurable manner, while also capturing learners' subjective experiences of this pedagogy. By doing so, the study aims to contribute empirical evidence to the growing translanguaging literature and to inform pronunciation pedagogy in EFL contexts.

LITERATURE REVIEW

Languaging and Translanguaging

The concept of *languaging* first emerged in the work of the Chilean biologist and philosopher Humberto Maturana and his co-author Francisco Varela, who

introduced the biological concept of *autopoiesis* in the early 1970s. It refers to a system that is able to self-reproduce and self-maintain (Maturana & Varela, 1980). Building on this perspective, American linguist, Becker, known for his studies of Southeast Asian languages, employed the term 'languaging' in his writing on translation. In 1988, he proposed that language should not be considered a system or a code containing rules or structures. It is through language that our experiences are shaped and retained so as to be recalled and shared. The role of language is not only to shape the context but also to be shaped by it. Further, he clarifies that the transition from 'language' to 'languaging' represents a shift from "an idea of language as something completed" to "an idea of language as an ongoing process (p. 25)." To him, language is a never-ending process, which is constantly recreated by linguistic interaction with the world.

This process-oriented view of language provides the conceptual foundation for contemporary theories of translanguaging. In this vein, according to Wei (2011), translanguaging is grounded in the psycholinguistic notion of *languaging*, which views language use as a dynamic process of meaning-making, learning, and communication. Translanguaging involves the fluid navigation of multilingual speakers across linguistic structures, systems, and modalities, thereby transcending fixed language boundaries. Rather than being limited to structural alternation or information exchange, it encompasses the full range of multilingual practices through which individuals construct meaning, negotiate identity, and enact social relationships. Wei (2011) further characterizes translanguaging as a transformative process that gives rise to a 'translanguaging space,' a socially and cognitively constituted arena in which multilingual speakers integrate their lived experiences, beliefs, cognitive resources, and social contexts into coherent and meaningful communicative performances.

Translanguaging for Language Learning and Teaching

In this study, translanguaging is understood as a theory of language that conceptualizes multilingual speakers' language use as the dynamic

deployment of an integrated linguistic repertoire, rather than the alternation between separate languages, for meaning-making and learning (Canagarajah, 2011; Otheguy et al., 2018; Wei, 2011). A central figure in the development of translanguaging as an educational framework is Ofelia García, whose work has been instrumental in extending translanguaging from a descriptive account of bilingual language use to a transformative pedagogy. She reconceptualizes bilingualism not as the balanced mastery of two separate languages, but as the flexible use of an integrated linguistic repertoire shaped by learners' social, cognitive, and educational experiences (García & Uysal, 2024). In educational settings, translanguaging is applied as a principled instructional approach that scaffolds comprehension, facilitates metalinguistic awareness, and reduces cognitive and affective barriers by legitimizing learners' first and additional languages as resources for learning rather than obstacles (García & Wei, 2015; García & Kleifgen, 2020).

Due to growing interest in translanguaging in L2 education, various translanguaging frameworks have been developed and implemented in the field of language education. As an example, Tang and Peng (2019) employed the '2 plus 1 plus 1' approach in their study. This approach involves using 1/2 English, 1/4 learners' native language (Chinese), and 1/4 material objects such as pictures, videos, radio, body language, and other language signs. The aim was to help students clear away the confusion between the pronunciations of Chinese alphabets and English alphabets. By incorporating both languages and various language resources, the students' comprehensive development of listening, speaking, reading, and writing was promoted. The researchers conducted experimental research in two small classes, one being an English-only class and the other being an experimental class that applied translanguaging. The findings of the study suggest that students in the experimental class were more active and effective in their learning compared to the English-only class. The application of translanguaging helped students clear away the confusion between the pronunciations of Chinese and English alphabets.

In this context, Sánchez et al. (2018) proposed an understanding of the education of bilinguals through a translanguaging lens by reframing the traditional language allocation policy for the purpose of reflecting the dynamic bilingualism of learners. A translanguaging language allocation policy, as Sánchez et al. (2018) state, can empower all students to communicate meaningfully regardless of their types of language performances and learning abilities. The three components of the Language Allocation Policy Framework in Dual Language Education include: (1) *Translanguaging documentation, (2) Translanguaging rings*, and (3) *Translanguaging transformation.* According to Sánchez et al. (2018), each component of this framework serves a distinct pedagogical function: (a) *Translanguaging Documentation*, aims to assess learners' full linguistic repertoires; (b) *Translanguaging Rings*, provide instructional scaffolding to support emergent bilinguals' learning; and (c) *Translanguaging Transformation*, affords learners opportunities for creative and critical language use, enabling them to challenge and move beyond the normative language boundaries typically imposed by schooling.

Recent scholarship has both extended and critically examined translanguaging in educational contexts. Building on earlier repertoire-based conceptualizations, scholars have emphasized translanguaging's role in mediating cognition, affect, and identity in classroom interaction, as well as its potential to challenge monolingual language ideologies (Wei & García, 2022; Wei et al., 2025). At the same time, linguistically oriented critiques have cautioned against overly expansive interpretations of translanguaging that risk obscuring structural constraints and language-specific form–meaning relationships, calling for greater empirical precision and domain-sensitive application (Otheguy et al., 2018; Otheguy et al., 2015). Recent classroom-based and mixed-methods studies have responded to these concerns by operationalizing translanguaging in more principled and measurable ways, examining its effects on specific linguistic domains and learner outcomes rather than treating it as a generalized pedagogical good (Huang & Chalmers, 2023; Derakhshan & Wei, 2026). However, as the

present review indicates, pronunciation, particularly the combined development of segmental and suprasegmental features, remains largely absent from these empirical examinations, underscoring the need for theoretically grounded and methodologically rigorous research in this area.

Recent research has highlighted the pedagogical and affective dimensions of translanguaging in Iranian EFL contexts. For instance, Khonamri et al. (2022), employing a mixed-methods design with 25 twelfth-grade bilingual students in Golestan, Iran, demonstrated that translanguaging, operationalized alongside English-only and L1-based instruction, significantly enhanced learners' grammatical understanding. Their quantitative findings indicated improved grammar learning, while qualitative data revealed positive learner perceptions of translanguaging in terms of language development, motivation, and self-confidence. Extending translanguaging research beyond learner outcomes, Nazari and Karimpour (2023) examined its impact on the emotional labor of eight Iranian EFL instructors in private language institutes through classroom observations, interviews, and narrative frames. Their findings conceptualized translanguaging as proficiency-inflected emotion work, a face-saving emotional practice, and an institutionally mediated emotional policy, underscoring the complex emotional demands associated with translanguaging use. Together, these studies underscore translanguaging's instructional benefits and its emotional implications for teachers, highlighting the need for context-sensitive pedagogical practices and supportive institutional environments.

Translanguaging and Second Language Pronunciation

Within L2 pronunciation research, segmental and suprasegmental features are regarded as key contributors to learners' intelligibility and communicative effectiveness. Accordingly, the present study focuses on both dimensions of pronunciation in the context of EFL learning. The suprasegmental features of pronunciation are speech characteristics that transcend individual sounds or phonemes, including stress, intonation, rhythm, and pitch (Levis, 2024).

Gilakjani (2012) maintains that these characteristics are crucial to pronunciation instruction because they carry substantial impact on the meaning and clarity of the spoken language. For instance, stress can alter the meaning of a word (such as *present* as a noun versus *present* as a verb) and intonation can convey various emotions or attitudes (such as a rising intonation at the end of a sentence indicating a question) (Gilakjani, 2012). He further asserts that by teaching students how to effectively use suprasegmental features, they can enhance their overall communicative competence and convey their intended meaning in spoken language.

Gilakjani (2016) demonstrates that many Iranian EFL learners experience persistent pronunciation difficulties, particularly in articulating certain English vowel and consonant sounds. For example, Iranian EFL learners struggle to differentiate between the /i:/ and /I/ vowels in words like 'sheep' and 'ship' or 'leave' and 'live' (Gilakjani, 2012). Furthermore, based on Seddighi's (2010) study, segmental pronunciation issues include vowel sounds and consonant sounds, and non-native English speakers may struggle to discern between different vowel sounds in English, such as the distinction between 'bit' and 'beat' or 'cot' and 'caught.' Given the central role of segmental features in pronunciation accuracy, difficulties with vowel and consonant contrasts can substantially affect speech intelligibility; moreover, research suggests that segmental and suprasegmental features jointly contribute to intelligibility, such that improvement in one domain may facilitate gains in the other (Wang, 2022).

While translanguaging has received increased attention in recent years for its potential to promote multilingualism and inclusivity in the classroom, relatively little research has been conducted on its application in teaching pronunciation. Among the limited number of relevant studies, Chen, Li, and Zhu (2021) examined the feasibility and effects of a multimodal translanguaging pedagogy in adult Languages Other Than English (LOTE) instruction, with a focus on French pronunciation. The purpose of their investigation was to determine how translanguaging multimodal pedagogy could be implemented in adult LOTE instruction, particularly in introductory

pronunciation instruction. They assert that the specific benefits of implementing translanguaging in teaching pronunciation include the activation of students' translanguaging awareness, the creation of a virtuous circle of teachers' and students' translanguaging practices, and the development of students' strategic translanguaging. However, the authors state that the interactions between strategic translanguaging, pedagogical translanguaging, and students' spontaneous translanguaging remain unexplored and require additional empirical research.

PURPOSE OF THE STUDY

The existing body of literature on translanguaging highlights its multifaceted pedagogical potential across a range of language skills. Nevertheless, empirical research examining the application of translanguaging to pronunciation instruction, particularly with respect to both segmental and suprasegmental features, is still lacking. Addressing this gap, the present study aims to investigate the effectiveness of translanguaging-based instructional practices in teaching challenging pronunciation features to Iranian EFL learners, with a focus on both segmental and suprasegmental dimensions. Thus, the present study is guided by the following research questions:

    (1) To what extent does translanguaging-based instruction of segmental and suprasegmental pronunciation features enhance Iranian EFL learners' pronunciation performance?

    (2) What are Iranian EFL learners' perceptions of translanguaging as a pedagogical approach to pronunciation instruction?

METHOD

Design of the study

This study employed a quasi-experimental mixed-methods design. The quantitative component followed a nonrandomized pretest–posttest control group design to examine the effectiveness of translanguaging pedagogy in

addressing challenging segmental and suprasegmental pronunciation features among Iranian upper-intermediate EFL learners. The integration of quantitative and qualitative approaches enabled a more comprehensive examination of both the instructional effects of the intervention and participants' subjective learning experiences (Johnson & Onwuegbuzie, 2004).

Quantitative data obtained from the pretest and posttest were subjected to statistical analysis to identify potential differences between the experimental and control groups. Complementing the quantitative phase, the study incorporated a qualitative component through semi-structured, face-to-face interviews. Post-intervention interviews were conducted with six participants randomly selected from the experimental group to explore their perceptions of the translanguaging pedagogy. The interview data were analyzed thematically following Braun and Clarke's (2023) analytic procedures.

Participants

The participants were 20 Iranian learners enrolled in an upper-intermediate English course at a private language institute in Isfahan, Iran. Convenience sampling was employed, with two intact classes assigned to the experimental and control groups without random allocation. The participants ranged in age from 16 to 24, shared the same first language (L1), namely Persian, and were placed at the upper-intermediate level based on the institute's placement examination.

Upper-intermediate learners were selected for two main reasons. First, they were the researcher's (second author) own students, allowing for greater control over instructional procedures. Second, learners at this level possess sufficient grammatical and lexical competence, as defined by the Common European Framework of Reference for Languages (CEFR), enabling them to focus on pronunciation features without being hindered by basic language difficulties. Previous research also indicates that learners at higher

proficiency levels place greater emphasis on improving pronunciation (Huensch & Thompson, 2017).

In the qualitative phase, post-intervention interviews were conducted with six participants selected from the experimental group using random sampling, with the aim of obtaining unbiased learner perspectives rather than targeting specific pronunciation ability levels. In addition, four raters evaluated participants' pronunciation accuracy: two experienced Iranian EFL teachers and two native English-speaking teachers from the United States. All raters had over five years of teaching experience. Including both native and non-native raters enabled comparative analysis of rater judgments and strengthened the reliability of pronunciation assessment. It is important to note that all the participants provided informed written consent before participating in the study.

Instruments

Pretest and Posttest

The pretest and posttest consisted of 15 sentences (see supplementary materials) containing the target segmental (/iː/, /uː/, /ʊ/, /oʊ/, /eɪ/, /aɪ/) and suprasegmental features (linking, reduction, progressive and regressive assimilation, epenthesis, deletion, word stress, and sentence stress) examined in the study. The sentences were adapted from the participants' course textbook and matched to their proficiency level. To control for potential confounding variables, the participants were familiarized with the lexical content of the sentences prior to testing to minimize the influence of lexical misunderstanding on pronunciation performance. The sentences were designed to elicit accurate production of the target features and to identify areas of pronunciation difficulty.

The distribution of pronunciation features across the sentences was not uniform, as certain features (e.g., linking) naturally occur more frequently than others (e.g., epenthesis). This imbalance reflects inherent differences in the frequency and distribution of linguistic phenomena rather than flaws in

test design. Furthermore, individual sentences were used rather than a continuous text to allow for focused elicitation and repetition of specific pronunciation features, a practice consistent with principles of pronunciation pedagogy that emphasize targeted practice (Darcy, 2018). Using familiar textbook materials further reduced cognitive load and enabled learners to focus on pronunciation (Mayer & Moreno, 2003).

Before the instructional treatment, the participants read the sentences aloud, with recordings made after two readings to reduce anxiety. Following 27 instructional sessions over approximately two months, the participants reread the same sentences and were recorded again. Both pretest and posttest recordings were rated by judges who were blind to group assignment. Comparisons between pretest and posttest ratings were conducted to determine the effect of the instructional treatment on learners' pronunciation performance.

Interview

A semi-structured interview was employed as the qualitative component of the study. The interview questions were developed based on three primary sources: (a) the theoretical and empirical background of the study, (b) findings from the quantitative phase, and (c) input from four experts in English language education with a focus on pronunciation. Grounding the questions in prior research and quantitative results ensured theoretical coherence and empirical relevance, while expert consultation enhanced the content validity of the interview protocol. To facilitate clear communication, the interview questions were translated into Persian, allowing the participants to fully comprehend and respond accurately. All interviews were conducted face-to-face and lasted approximately 10–15 minutes. The participants' responses were initially provided in Persian and subsequently translated into English for analysis. The interview questions are presented in supplementary materials of this study.

Praat

Praat (Boersma & Weenink, 2025) was used to analyze the acoustic features of the participants' speech samples, focusing on F1 and F2 formant frequency values, as these values are closely associated with the articulatory muscles and manner of articulation of vowels. This analysis allowed the researchers to compare the acoustic features of the speech samples from the control group and the experimental group. This comparison helped the researchers determine whether the experimental treatment had any significant effects on the participants' speech production. Praat was employed to evaluate the six segmental features (i.e., /iː/, /uː/, /ʊ/, /oʊ/, /eɪ/, /aɪ/).

Treatment

The instructional treatment in this study was grounded in two complementary pedagogical frameworks: translanguaging pedagogy and a communicative framework for pronunciation instruction. The translanguaging component was informed by Sánchez et al.'s (2018) *Language Allocation Policy Framework in Dual Language Education*. Although originally developed for bilingual education contexts, this framework was adapted for an EFL setting in the present study, constituting an innovative methodological contribution. The framework advocates a translanguaging-oriented language allocation policy that promotes meaningful communication and equitable participation by drawing on learners' full linguistic repertoires. The framework comprises three interrelated components: *translanguaging documentation, translanguaging rings,* and *translanguaging transformation*. *Translanguaging documentation* was used to assess learners' complete linguistic knowledge of target pronunciation features across English and Persian. *Translanguaging rings* functioned as a pedagogical scaffold to support learners' understanding during instruction, while *translanguaging transformation* aimed to foster learner autonomy through creative and critical language use beyond conventional classroom language norms.

Pronunciation instruction was additionally guided by Celce-Murcia et al.'s (2010) *Communicative Framework for Teaching Pronunciation*, which

situates pronunciation within meaningful communication. This framework consists of five instructional stages: description and analysis, listening discrimination, controlled practice, guided practice, and communicative practice, and is designed to facilitate the progression from controlled to automatic phonological processing.

Instruction was delivered over 27 sessions spanning approximately two months, with 20 minutes of each 120-minute session devoted specifically to pronunciation. Prior to instruction, the participants completed a pretest involving the oral reading of 15 sentences containing target segmental (/iː/, /uː/, /ʊ/, /oʊ/, /eɪ/, /aɪ/) and suprasegmental features (e.g., linking, assimilation, epenthesis, deletion, reduction, and sentence stress). These features were selected based on prior research identifying their difficulty for Persian-speaking EFL learners (Nosratinia & Zaker, 2014), their importance for intelligibility and communicative effectiveness (Gilakjani, 2012; Zarifi & Sayyadi, 2015), and their occurrence in the course textbook. As part of *translanguaging documentation*, learners also read Persian sentences containing analogous features, allowing the researcher to examine their L1 phonological repertoire.

During instruction, translanguaging rings were integrated into the first four stages of the communicative framework. Learners engaged in structured activities using both Persian and English through specially designed worksheets (see supplementary materials). Instruction frequently involved alternating input and output across languages, consistent with translanguaging principles (Williams, 2002). For example, Persian explanations and examples were used to introduce linking before students analyzed and produced English examples. Activities progressed from description and analysis to listening discrimination, controlled practice, and guided practice, including pair work and image-based description tasks.

Figure 1: A sample of guided practice

Note. To describe Figure 1, learners said sentences like "He took off his shoes and entered the room" or "He took off his shoes at the door", which included one to two examples of linking.

Translanguaging transformation was implemented during the communicative practice stage. Learners participated in group discussions, debates, role-plays, and presentations, during which they were permitted to freely draw on both Persian and English. The instructor monitored pronunciation performance, noted recurring errors related to target features, and provided delayed corrective feedback to maintain communicative flow. Previously taught pronunciation features were regularly reviewed to reinforce learning. For ethical reasons and to gauge learners' attitudes, the participants were informed about the instructional approach prior to its implementation. Pretest and posttest results did not contribute to course grades.

In contrast, the control group received pronunciation instruction exclusively through the communicative framework, completing all five instructional stages in English only and the use of the L1 was not permitted at any stage of instruction.

Data Analysis

Quantitative data obtained from the pretest and posttest reading tasks were analyzed using descriptive and inferential statistics. During both testing

phases, the participants read aloud sentences containing the target pronunciation features, and their speech was audio-recorded. Quantitative data obtained from the pretest and posttest were analyzed using inferential statistics, including independent-samples and paired-samples t-tests for acoustic measures and Mann–Whitney U and Wilcoxon signed-rank tests for rater-based pronunciation scores that did not meet normality assumptions.

To assess the accuracy of the participants' pronunciation, four raters evaluated all speech recordings. Prior to rating, the raters received training using a set of sample recordings and were familiarized with the evaluation procedures to ensure consistency. They were then provided with a detailed scoring rubric (see supplementary materials) covering both segmental and suprasegmental pronunciation features. Pronunciation accuracy was assessed using a feature-based analytic rubric adapted from Celce-Murcia et al. (2010). Raters evaluated the accurate realization of predefined segmental features (vowels and diphthongs) and suprasegmental features (e.g., word stress, sentence stress, linking, assimilation, epenthesis, deletion, and reduction) in sentence-level production. Each rater assigned a score of 1 for accurate production and 0 for inaccurate production of each target feature in the learners' speech. For each participant, pronunciation scores were calculated by summing the correct responses and dividing the total by the number of assessed features, yielding a composite score ranging from 0 to 1. This scoring procedure enabled systematic comparison of pretest and posttest performance at both the overall and feature-specific levels, thereby allowing for an evaluation of the effectiveness of the translanguaging pedagogy in improving learners' pronunciation. Independent-samples and paired-samples t-tests were conducted to examine differences between pretest and posttest performance within and across the experimental and control groups, thereby assessing the effectiveness of the instructional intervention.

To further examine segmental pronunciation accuracy, acoustic analysis was conducted using the Praat speech analysis software. Formant frequency values (F1 and F2) were measured, as these parameters are closely associated with vowel articulation and tongue positioning. The acoustic measurements

were compared against established reference values reported in previous studies (e.g., Hillenbrand et al., 1995; Lee et al., 2014). Acoustic analysis was limited to segmental features, as no validated acoustic criteria were available for the selected suprasegmental features.

Qualitative data collected through semi-structured interviews were analyzed using thematic analysis following Braun and Clarke's (2023) framework. Interview recordings were transcribed, and recurring patterns and themes were identified to capture learners' perceptions of translanguaging pedagogy and its role in pronunciation learning.

RESULTS

The results are organized by research question, with the first part of this section reporting the quantitative findings related to pronunciation performance (RQ1) and the subsequent part (see *Findings from the Interviews* section) presenting the qualitative findings on learners' perceptions of translanguaging-based instruction (RQ2).

Human Evaluation

Prior to conducting inferential analyses, the researchers assessed the normality of the data distribution using both the Kolmogorov–Smirnov and Shapiro–Wilk tests. These tests were employed to determine whether the observed data conformed to a normal distribution. As indicated by the results (see supplementary materials), statistically significant deviations from normality were detected, indicating that the assumption of normality was violated. Thus, given the non-parametric nature of the data, the researchers performed a series of Mann-Whitney U and Wilcoxon signed-rank tests to compare the two groups from pretests to posttests to determine the impact of treatment on the participants' performance.

Intercoder Reliability

Initially, to assess the inter-rater reliability of the analysis, Pearson's correlation coefficient was performed. It is important to note that due to the

large volume of data, native speakers analyzed only half of it, and no reliability test could be conducted on their analysis. Table 1 shows the intercoder reliability indices for the Iranian raters. As it is shown, for pretest and posttest scores, the reliability is acceptable as it exceeds the cut-off point of 0.70 (Brown, 2011).

Table 1. Intercoder reliability reports for the pretests and posttests (Iranian raters)

	Iranian	
	pretests	posttests
Linking	.965	.98
Progressive	.376	.939
Regressive	1	.949
Epenthesis	.954	.911
Deletion	.874	.93
Reduction	.514	.98
Sentence Stress	.765	.76
/iː/	.98	.98
/uː/	1	.89
/oʊ/:	.95	.90
/ʊ/	.884	.90
/eɪ/	1	.984
/aɪ/	.09	.963
Word stress	.683	.923
Total	.701	.934

Pretest Scores

The Mann-Whitney U test results in Table 2 provide insights into the differences between the two groups on their pretests. The test statistics show the U values, Wilcoxon W values, Z statistics, and the asymptotic and exact p-values for each variable.

Based on the obtained results, there is no significant difference between the two groups on their pretests for all variables. The p-values are greater than the conventional significance level of 0.05, indicating that the observed differences are not statistically significant with the exception of /aɪ/ with p-value of $0.021 < 0.05$.

Table 2. Mann-Whitney U test results for the two groups on pretest

Variable	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)	Exact Sig. [2*(1-tailed Sig.)]
Linking	35.5	90.5	-1.101	0.271	0.280a
Progressive	44.5	99.5	-0.424	0.672	0.684a
Regressive	45	100	-1	0.317	0.739a
Epenthesis	31.5	86.5	-1.508	0.132	0.165a
Deletion	47	102	-0.235	0.814	0.853a
Reduction	46.5	101.5	-0.29	0.772	0.796a
Sentence Stress	35	90	-1.826	0.068	0.280a
/iː/	41	96	-0.765	0.445	0.529a
/uː/	35	90	-1.314	0.189	0.280a
/oʊ /	49.5	104.5	-0.041	0.967	0.971a
/ʊ /	45.5	100.5	-0.382	0.702	0.739a
/eɪ /	44	99	-0.535	0.592	0.684a
/aɪ /	27	82	-2.3	0.021	0.089a
Word stress	36.5	91.5	-1.137	0.255	0.315a

a.   Not corrected for ties

Posttest Scores

The Mann-Whitney U test results show that the experimental and control groups have significantly different posttest scores for several variables, including linking, regressive, progressive assimilation, epenthesis, deletion, reduction, sentence stress, /aɪ /, and word stress (Table 3). The p-values obtained are less than 0.05, indicating that the observed differences are statistically significant. This suggests that the treatment influenced the experimental group's posttest performance for the variables of interest.

Table 3. Mann Whitney U test results for the two groups on the posttest

Variable	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)	Exact Sig. [2*(1-tailed Sig.)]
Linking	0	55	-3.791	0	0.000a
Progressive	37	92	-1.032	0.302	0.353a
Regressive	20	75	-2.669	0.008	0.023a
Epenthesis	20	75	-2.828	0.005	0.023a
Deletion	0	55	-3.832	0	0.000a
Reduction	8	63	-3.297	0.001	0.001a
Sentence Stress	22.5	77.5	-2.593	0.01	0.035a
Word stress	9	64	-3.342	0.001	0.001a
/iː/	32	87	-1.528	0.126	0.190a
/uː/	45	100	-0.503	0.615	0.739a
/oʊ /	39.5	94.5	-0.898	0.369	0.436a
/ʊ /	28.5	83.5	-1.834	0.067	0.105a
/eɪ /	35	90	-1.826	0.068	0.280a
/aɪ /	20	75	-2.828	0.005	0.023a

a. Not corrected for ties

Pretest to Posttest Scores

The table reports the results of Wilcoxon signed-rank tests comparing the experimental group's pretest and posttest performance on selected suprasegmental and segmental pronunciation features. Median scores are presented alongside Z values, two-tailed significance levels, and effect sizes (r).

The Wilcoxon signed-rank test results indicate significant improvements in most suprasegmental features following the translanguaging-based instruction. Statistically significant gains were observed for linking, regressive assimilation, epenthesis, deletion, reduction, sentence stress, and word stress, all with large effect sizes ($r = 0.67–0.96$). In contrast, progressive assimilation did not show a significant change ($p = 0.13$). Regarding segmental features, significant improvement was found for the vowels /uː/ and /ʊ/ ($p = .04$), with large effect sizes ($r = 0.63$). No significant changes were observed for /iː/, /oʊ/, /eɪ/, or /aɪ/, largely due to ceiling effects, as

median scores were already high at pretest. Overall, these findings suggest that translanguaging-based instruction was particularly effective in enhancing suprasegmental aspects of pronunciation, while its impact on segmental features was more limited and feature-specific.

Table 4. Wilcoxon signed-rank test results for all the features from pretest to posttest

Variable	Pre-test median	Post-test median	Z	Asymp. Sig. (2-tailed)	r
Linking	0.14	.56	-2.80	0.00	.89
Progressive	.92	.96	-1.50	.13	.47
Regressive	0	.50	-2.64	.00	.83
Epenthesis	.75	1.00	-2.12	.03	.67
Deletion	.45	.76	-2.81	.00	.89
Reduction	.80	1.00	-2.38	.01	.75
Sentence Stress	0	.50	-3.05	.00	.96
Word stress	.50	.75	-2.72	.00	.86
/iː/	1.00	1.00	-1.00	.31	.31
/uː/	.85	1.00	-2.00	.04	.63
/oʊ/	1.00	1.00	-1.82	0.68	.57
/ʊ/	.50	1.00	-2.00	.04	.63
/eɪ/	1.00	1.00	-1.60	.10	.50
/aɪ/	1.00	1.00	0	1.00	0

Computerized Evaluation

This section also presents the key findings relevant to addressing the first research question. For the sake of conciseness and to limit the use of tables and figures, only statistically significant results are reported here; the complete statistical analyses are provided in the supplementary materials.

/oʊ/

The F1 and F2 frequencies of both onset and offset were compared with the acoustic study of American English diphthongs conducted by Lee et al. (2014). For women, the onset frequencies were F1 at 622 Hz and F2 at 1245 Hz, while the offset frequencies were F1 at 448 Hz and F2 at 1149 Hz. For men, the onset frequencies registered F1 at 599 Hz and F2 at 1439 Hz, and the offset frequencies were F1 at 431 Hz and F2 at 1431 Hz.

Onset F2 Frequency Analysis: The analysis of the posttest results of the experimental group indicated that there was no statistically significant difference between the experimental group's scores and the criterion

established by Lee et al. (2014), (M = 85.8, SD = 243.5), t (9) = 1.114, p = 0.294 (see Table 5). Conversely, the posttest and pretest findings of the control group exhibited a significant difference compared to the criterion established by Lee et al. (2014).

Table 5. Paired samples t-test, comparing the pre and posttest results of the /oʊ / diphthong onset F2 production in the experimental and control groups

Tests	Mean	Std Deviation	Std. Error Mean	Paired Differences		T	Df	Sig. (2-tailed)
				95% Confidence Interval of the Difference Lower	95% Confidence Interval of the Difference Upper			
Pretest Experimental	-112.70000	247.95947	78.41167	-290.07952	64.67952	-1.437	9	.184
Posttest Experimental	85.80000	243.59315	77.03092	-88.45604	260.05604	1.114	9	.294
Pretest Control	-221.75000	289.13734	91.43326	-428.58639	-14.91361	-2.425	9	.038
Posttest Control	-206.50000	270.40895	85.51082	-399.93891	-13.06109	-2.415	9	.039

Consequently, a paired t-test analysis was conducted on the posttest performance of the experimental group. The analysis revealed a significant difference in the posttest and pretest results of the experimental group (M = -198.5, SD = 197.9), t (9) = -3.172, p = 0.011, providing evidence for the effectiveness of the translanguaging framework (Table 6).

Table 6. Paired samples t-test, comparing the pre and posttest results of the /oʊ/ diphthong F2 onset production in the experimental and control groups

Tests	Mean	Std Deviation	Std. Error Mean	Paired Differences		T	df	Sig. (2-tailed)
				95% Confidence Interval of the Difference Lower	95% Confidence Interval of the Difference Upper			
Pretest Experiment-Posttest Experiment	-198.50000	197.91875	62.58741	-340.08255	-56.91745	-3.172	9	.011
Pretest Control-Posttest Control	-15.25000	210.62015	66.60394	-165.91858	135.41858	-.229	9	.824

Offset F1 Frequency Analysis: The production of the F1 formant of offset did not significantly differ from Lee et al.'s (2014) criterion in neither the control nor the experimental posttest and pretest results (see Table 7).

Table 7. Paired samples t-test, comparing the pre and posttest results of the /oʊ / diphthong offset F1 production in the experimental and control groups

Tests	Mean	Std Deviation	Std. Error Mean	Paired Differences		T	df	Sig. (2-tailed)
				95% Confidence Interval of the Difference Lower	95% Confidence Interval of the Difference Upper			
Pretest Experimental	68.70000	145.01230	45.85692	-35.03555	172.43555	1.498	9	.168
Posttest Experimental	24.35000	47.97109	15.16979	-9.96645	58.66645	1.605	9	.143
Pretest Control	50.95000	109.27195	34.55482	-27.21844	129.11844	1.474	9	.174
Posttest Control	-8.95000	82.97672	26.23954	-68.30797	50.40797	-.341	9	.741

As a result, the posttest and pretest results were analyzed through a paired t-test, but the difference between the pre- and posttest scores was not significant in either group (Table 8).

Table 8. Paired samples t-test, comparing the pre and posttest results of the /oʊ/ diphthong F1 offset production in the experimental and control groups

Tests	Mean	Std Deviation	Std. Error Mean	Paired Differences		T	df	Sig. (2-tailed)
				95% Confidence Interval of the Difference Lower	95% Confidence Interval of the Difference Upper			
Pretest Experiment-Posttest Experiment	44.35000	131.32425	41.52837	-49.59371	138.29371	1.068	9	.313
Pretest Control-Posttest Control	59.90000	112.36493	35.53291	-20.48103	140.28103	1.686	9	.126

/eɪ /

The F1 and F2 frequencies of onset and offset were compared to an acoustic analysis of American English diphthongs by Lee et al. (2014). For women, the onset frequencies were F1 at 577 Hz and F2 at 2245 Hz, with offset frequencies of F1 at 394 Hz and F2 at 2714 Hz. For men, the onset frequencies were F1 at 506 Hz and F2 at 1936 Hz, with offset frequencies of F1 at 324 Hz and F2 at 2308 Hz.

F2 Onset Frequency Analysis: The production of the F1 formant of offset did not differ substantially from Lee et al.'s (2014) criterion in either the control or experimental posttest and pretest results (see Table 9).

Table 9. Paired samples t-test, comparing the pre and posttest results of the /eɪ / diphthong onset F2 production in the experimental and control groups

Tests	Mean	Std Deviation	Std. Error Mean	Paired Differences 95% Confidence Interval of the Difference Lower	95% Confidence Interval of the Difference Upper	T	Df	Sig. (2-tailed)
Pretest Experimental	- 253.25000	441.53056	139.62422	- 569.10194	62.60194	-1.814	9	.103
Posttest Experimental	77.85000	252.50490	79.84906	- 102.78112	258.48112	.975	9	.355
Pretest Control	-124.0000	406.72520	128.61780	- 414.95368	166.95368	-.964	9	.360
Posttest Control	-187.1000	370.97161	117.31152	- 452.47710	78.27710	-1.595	9	.145

As a result, posttest and pretest data were compared using a paired t-test. The experimental group's posttest results differed significantly from the pretest results (M = -331.1, SD = 453.2), t (9) = -2.31, p = 0.046. The control group's posttest results did not differ significantly from the pretest results (M = 63.1, SD = 315.16), t (9) = 0.633, p = 0.542, indicating that only the translanguaging framework was effective in producing F2 frequency at the onset of this diphthong (see Table 10).

Table 10: *Paired samples t-test, comparing the pre and posttest results of the /eɪ / diphthong F2 onset production in the experimental and control groups*

Tests	Mean	Std Deviation	Std. Error Mean	Paired Differences		T	df	Sig. (2-tailed)
				95% Confidence Interval of the Difference Lower	95% Confidence Interval of the Difference Upper			
Pretest Experiment-Posttest Experiment	-331.10000	453.27290	143.33748	-655.35190	-6.84810	-2.310	9	.046
Pretest Control-Posttest Control	63.10000	315.16008	99.66237	-162.35194	288.55194	.633	9	.542

Findings from the Interviews

Enhanced Learning Experience through Translanguaging

Analysis of the interview data revealed that the participants consistently perceived translanguaging pedagogy as enhancing their overall pronunciation learning experience. Recurrent codes, including 'faster comprehension', 'improved pronunciation development', 'reduced confusion', 'increased interest', 'lower stress', 'enhanced confidence', 'greater comfort', and 'reduced boredom', were grouped into the first theme.

All six participants reported that translanguaging facilitated their pronunciation development by improving comprehension and reducing confusion. Learners noted that explanations involving their L1 enabled them to grasp pronunciation features more quickly and accurately. As one participant stated, "I understand my teacher's point better," while another explained, "Translanguaging helps me understand how to pronounce faster." Four participants emphasized that translanguaging was less confusing than traditional pronunciation instruction, in which they often struggled to distinguish and apply different pronunciation features. These accounts

suggest that translanguaging reduces cognitive overload and supports clearer understanding of complex pronunciation points.

Five of the six participants reported increased interest and motivation toward pronunciation learning following translanguaging-based instruction. The participants described translanguaging-based activities as enjoyable and engaging, particularly when contrasted with traditional pronunciation instruction. One learner remarked, "Translanguaging pedagogy is fun and not boring like traditional methods," while another noted, "I used to hate pronunciation exercises, but translanguaging has made me want to work on my pronunciation more." These responses indicate that translanguaging reshaped learners' attitudes toward pronunciation, transforming it from a tedious task into a more stimulating and meaningful learning experience.

The participants also highlighted the affective benefits of translanguaging, particularly in reducing stress and increasing confidence. Three learners explicitly stated that using Persian alongside English helped them feel more relaxed and confident when speaking. One participant explained, "If I can talk to my friends in Persian first to get my thoughts in order, I can speak English more confidently." Another reported that "explanations in Persian reduced anxiety by minimizing the risk of misunderstanding". These findings underscore the importance of linguistic accessibility in creating a supportive learning environment that fosters emotional comfort and confidence.

Overall, this theme demonstrates that translanguaging contributes to a more positive and effective pronunciation learning experience by supporting comprehension, engagement, and emotional well-being. However, learners' reflections also raised questions about the extent to which these benefits extend beyond the classroom.

Pedagogical Scope and Practical Applicability of Translanguaging

Beyond classroom experience, the participants reflected on the broader pedagogical scope and real-world applicability of translanguaging. However, the participants expressed mixed views regarding the usefulness of

translanguaging for pronunciation in real-life communication. Two learners reported uncertainty, citing limited experience in applying translanguaging outside the classroom. In contrast, three participants perceived translanguaging as beneficial, explaining that it heightened their awareness of pronunciation in both Persian and English. One participant noted that translanguaging made her pay more attention to pronunciation, while another reported increased sensitivity to pronunciation features across languages. Only one participant rejected its usefulness, stating, "I don't think so, because when I speak, I'm only worried about my grammar." This perspective reflects a narrow view of communicative competence and suggests limited recognition of pronunciation's role in effective communication.

The participants also acknowledged that translanguaging was not equally effective for all pronunciation features. Five learners noted that translanguaging worked better for some errors than others, particularly when Persian and English phonological systems differed. As one participant observed, "The downside of translanguaging pedagogy is that it cannot be used for all pronunciation points." Another commented that translanguaging was most helpful "for very difficult cases." These reflections suggest that while translanguaging supports general pronunciation development, it may be less effective for language-specific phonetic contrasts, highlighting the need for complementary instructional approaches.

Despite these limitations, all six participants believed that translanguaging could be effectively applied to other language skills, particularly speaking, writing, and grammar. One participant stated, "I think it is really helpful for writing. It may help you come up with ideas," while another emphasized its value for speaking by reducing anxiety and increasing confidence. Grammar was also viewed as a promising area, with one learner noting that translanguaging could make grammar learning more engaging. These responses indicate that learners perceive translanguaging as a flexible pedagogical resource with broad instructional potential beyond pronunciation.

Taken together, this theme highlights learners' nuanced views of translanguaging's pedagogical reach. While recognizing its limitations, especially for certain pronunciation features, the participants largely viewed translanguaging as a versatile and meaningful approach with practical applications across language skills and learning contexts.

DISCUSSION

The results indicated that the instructional treatment led to statistically significant improvements in several suprasegmental features, most notably linking, epenthesis, deletion, sentence stress, and word stress, while gains in segmental features were more limited. Although rater-based analyses suggested improvement in the production of /aɪ/, this effect was not confirmed by computerized acoustic analysis. Acoustic measurements further revealed significant improvements in the F2 values of /oʊ/ and /eɪ/ at diphthong onset, suggesting enhanced control over tongue positioning. This divergence between perceptual ratings and acoustic measures highlights the complexity of pronunciation assessment and underscores the need for multi-method approaches.

The perceptual–acoustic discrepancy can be attributed to several complementary factors. First, although raters were trained and familiarized with the scoring procedures using sample recordings, perceptual judgments are inevitably influenced by salient global cues (e.g., overall fluency, prosodic smoothness, and intelligibility) that may improve even when a specific segment does not show robust acoustic change. In other words, listeners may register improvement because speech sounds more connected and rhythmically appropriate (e.g., through gains in linking, stress, and reduction), which can mask residual segmental imprecision in impressionistic ratings. Second, some acoustic correlates are more perceptually prominent than others: listeners may attend to broader timing and prominence patterns and to categorical good-enough realizations, whereas acoustic analysis captures fine-grained deviations that may not cross listeners' perceptual thresholds. Third, the acoustic analysis in this study was intentionally narrow

and feature-specific, focusing on formant-based measures (F1/F2, particularly onset and offset values) for selected vowels and diphthongs in controlled sentence readings; such measurements capture only certain aspects of segmental change and do not directly index other dimensions that shape perceived accuracy (e.g., duration, coarticulation, spectral dynamics across the whole vowel, or contextual variation across tokens). These considerations help explain why raters perceived improvement for /aɪ/ while the corresponding acoustic comparisons did not yield confirmatory evidence, underscoring the value of triangulating listener judgments with targeted acoustic metrics rather than treating either source as definitive.

Another key finding of the study is that suprasegmental features were more amenable to change than segmental features. One explanation lies in cross-linguistic transfer, as suprasegmental features often share similarities across languages, enabling learners to draw on their L1 prosodic knowledge. Suprasegmental features such as stress, rhythm, and linking operate over larger units of speech and are inherently relational and discourse-oriented, a perspective consistent with translanguaging's view of language as an integrated system (Otheguy et al., 2018; Wei & García, 2022). As such, they are more amenable to cross-linguistic comparison and metalinguistic reflection, processes that translanguaging pedagogy explicitly encourages (Wei et al., 2025). By drawing on learners' L1 prosodic knowledge, translanguaging appears to have facilitated positive transfer and heightened phonological awareness, enabling learners to restructure their L2 prosodic patterns more effectively. Furthermore, the greater responsiveness of suprasegmental features aligns with intelligibility-based models, which emphasize the functional role of prosody in successful communication (Munro & Derwing, 2015). Suprasegmental features contribute disproportionately to comprehensibility, and learners may therefore be more perceptually attuned to improvements in these areas. Translanguaging, by situating pronunciation within meaningful communicative contexts and allowing learners to process form–meaning relationships across languages, likely reinforced this functional orientation to pronunciation learning. Prior

research has also shown that sensitivity to suprasegmental features facilitates bilingual language development and literacy (Deng & Tong, 2021; Tong et al., 2017). .

In contrast, the relatively limited gains observed for segmental features can be explained by insights from phonetic acquisition and articulatory phonology. Segmental production involves fine-grained motor control and entrenched articulatory routines that are often resistant to change, particularly in adult learners (Iskarous & Mooshammer, 2021). It can be inferred that while translanguaging may enhance conceptual understanding of phonemic contrasts, it does not necessarily provide the intensive motor practice required for restructuring vowel and consonant articulation. This distinction helps explain why perceptual ratings suggested some improvement in certain vowels, whereas acoustic analysis revealed significant changes only for specific diphthongs at onset positions. These findings underscore the need to view translanguaging as complementary rather than sufficient for segmental pronunciation development.

Overall, the findings align with previous research highlighting the pedagogical value of translanguaging in language learning (Wei et al., 2025). By leveraging learners' full linguistic repertoires, translanguaging fosters deeper cognitive engagement, supports pronunciation development, and creates an inclusive learning environment that validates multilingual identities (Adams, 2020; Aljuwaisri, 2024). Furthermore, the results of the present study suggest that translanguaging facilitates pronunciation development not by directly reshaping articulatory habits, but by enhancing phonological awareness and promoting positive transfer. In this sense, translanguaging operates as a mediating framework that complements communicative pronunciation instruction, particularly for suprasegmental features that are central to intelligibility and discourse-level meaning.

Analysis of the interview data also provided important insights into learners' perceptions of translanguaging in pronunciation instruction. The findings converged around two overarching themes: *Enhanced Learning Experience Through Translanguaging* and *Pedagogical Scope and Practical*

Applicability of Translanguaging, both of which illuminate the cognitive, affective, and instructional dimensions of translanguaging in the EFL pronunciation classroom.

The first theme, *Enhanced Learning Experience Through Translanguaging*, reflects learners' shared perceptions of translanguaging as a facilitative and supportive instructional approach. Consistent with previous research (Adams, 2020; Otheguy et al., 2018; Torres et al., 2020), the participants reported that translanguaging contributed to faster learning, clearer understanding of instructional explanations, improved pronunciation, increased interest, reduced stress, and enhanced confidence. Learners emphasized that the use of their L1 helped reduce confusion and cognitive overload, enabling them to focus more effectively on challenging pronunciation features. These findings support the view that translanguaging fosters a psychologically safe and inclusive learning environment, which is conducive to both linguistic development and learner well-being. Recent studies likewise position translanguaging as an emotion–cognition mediating pedagogy that reduces anxiety while enhancing comprehension and metalinguistic awareness (Derakhshan & Wei, 2026; Wang & Chen, 2026).

The second theme, *Pedagogical Scope and Practical Applicability of Translanguaging,* captures learners' views on the broader usefulness and limitations of translanguaging beyond immediate classroom instruction. While some participants expressed uncertainty about applying translanguaging strategies in real-life pronunciation practice, existing theoretical and empirical work underscores its relevance to authentic multilingual communication (Mazzaferro, 2018; Seals et al., 2020; Wei et al., 2025). The participants in the present study also acknowledged that translanguaging was not equally effective for all pronunciation features, noting particular limitations when Persian and English phonological systems diverged. Nevertheless, learners viewed translanguaging as a flexible pedagogical resource with potential applications beyond pronunciation, including speaking, writing, and grammar. This perception aligns with previous studies demonstrating the effectiveness of translanguaging across

multiple language skills (Adamson & Coulson, 2015; García & Kleifgen, 2020; Khonamri et al., 2022; Tang & Peng, 2019).

In synthesis, the qualitative findings help contextualize and interpret the quantitative results. Learners' reports of clearer understanding, reduced cognitive load, and lower anxiety provide an explanatory lens for the significant gains observed in suprasegmental features. The participants described how L1-supported explanations and cross-linguistic comparison enabled them to notice and regulate discourse-level pronunciation patterns more effectively, which aligns with the statistically significant improvements found in these features. Conversely, learners' acknowledgment that translanguaging was less effective for certain pronunciation points mirrors the limited and feature-specific gains observed for segmental features in the quantitative analyses. Taken together, the convergence of quantitative improvements and learners' experiential accounts suggests that translanguaging primarily facilitates pronunciation development by enhancing phonological awareness, affective engagement, and attentional focus, rather than by directly restructuring entrenched articulatory routines.

Like all empirical research, this study has several limitations. The participants were drawn exclusively from Iranian EFL learners at a single private institute where the researcher worked, limiting generalizability. Random assignment was not feasible due to institutional constraints, and small class sizes (ten learners) reduced statistical power. Rater availability required distributing speech evaluations across native English-speaking raters. Acoustic analysis using Praat was limited to vowels and diphthongs because objective criteria for suprasegmental features remain underdeveloped. Finally, reliance on native-speaker benchmarks may unintentionally reinforce native-speakerism and overlook legitimate variation in non-native speech production.

Future research should adopt longitudinal designs to examine the sustained effects of translanguaging on pronunciation development. Further studies could also explore its applicability across diverse learner populations, proficiency levels, age groups, and instructional contexts. Comparative

investigations contrasting translanguaging-based and monolingual pronunciation instruction, as well as research on teacher preparation, cross-linguistic transfer, multimodal approaches, and sociocultural influences, would deepen understanding of translanguaging's pedagogical potential.

CONCLUSION AND IMPLICATIONS

The findings of the present study demonstrate that the translanguaging framework exerted a statistically significant effect on several challenging pronunciation features, particularly suprasegmental aspects such as linking, epenthesis, deletion, sentence stress, and word stress. Although some segmental improvement was observed, most notably for the diphthong /aɪ/ in perceptual ratings, computer-assisted acoustic analysis did not confirm a significant effect for this feature. Instead, the acoustic data revealed improvements in F2 frequency at the onset of the /oʊ/ and /eɪ/ diphthongs, suggesting enhanced control over tongue positioning during diphthong production. This divergence between perceptual judgments and acoustic measurements highlights the complexity of pronunciation assessment and underscores the value of employing both subjective and objective analytic methods.

Overall, learners exposed to translanguaging pedagogy demonstrated greater gains in suprasegmental features than in segmental ones. This finding suggests that suprasegmental features may be more responsive to instruction that leverages learners' full linguistic repertoires, whereas segmental features, often deeply entrenched through habitual articulatory patterns, may require more prolonged and targeted phonetic training. The results support the efficacy of translanguaging as a pedagogical framework for addressing specific pronunciation challenges by drawing on learners' L1 as a cognitive and instructional resource. In addition to measurable pronunciation gains, qualitative findings indicated that translanguaging fostered an enhanced learning experience characterized by clearer understanding of instructional input, increased engagement, reduced anxiety, greater confidence, and a more inclusive classroom environment. However, learners also noted that the

effectiveness of translanguaging varied depending on the type of pronunciation feature, highlighting the need for principled and selective application.

The findings of this study yield several practical implications for EFL pronunciation instruction. First, teachers can strategically integrate translanguaging practices, such as brief L1-supported explanations, cross-linguistic comparison, and guided reflection to facilitate the teaching of suprasegmental features that are central to intelligibility (e.g., stress, linking, and reduction). Second, allowing principled use of learners' L1 may reduce anxiety and cognitive overload, thereby creating a more supportive classroom environment that encourages sustained engagement with pronunciation practice. Third, given the limited impact on segmental features, translanguaging should be used in conjunction with targeted phonetic training and repeated articulatory practice rather than as a standalone approach. Finally, teacher education programs and institutional policies should move beyond rigid English-only norms and equip instructors with practical guidance on how to implement selective, pedagogically informed translanguaging in pronunciation-focused instruction.

Disclosure statement

No potential conflict of interest was reported by the authors.

ORCID

Musa Nushi   (iD)   http://orcid.org/0000-0003-1917-5372
Parisa Zibaei   (iD)
Mehran Hosseinkhani (iD)   http://orcid.org/0009-0002-4018-2235

References

Adams, B. L. (2020). How English-speaking teachers can create a welcoming environment that allows students to maintain and utilize their language through translanguaging: A qualitative case study. *Journal of Culture and Values in Education*, *3*(2), 196–211. https://doi.org/10.46303/jcve.2020.20Adamson, J., & Coulson, D. (2015). Translanguaging in English academic writing preparation. *International Journal of Pedagogies and Learning*, *10*(1), 24–37. https://doi.org/10.1080/22040552.2015.1084674

Aljuwaisri, A. (2024). Empowering multilingual learners: A translanguaging approach to English language teaching at Kuwaiti universities. *Journal of Learning and Development Studies*, *4*(1), 18–27.

Becker, A. L. (1988). Language in particular: A lecture. In D. Tannen (Ed.), *Linguistics in context: Connecting observation and understanding* (pp. 17–35). Ablex.

Boersma, P., & Weenink, D. (2025). *Praat: Doing phonetics by computer* (Version 6.4.49) [Computer software]. https://www.praat.org

Braun, V., & Clarke, V. (2023). Thematic analysis. In H. Cooper, M. N. Coutanche, L. M. McMullen, A. T. Panter, D. Rindskopf, & K. J. Sher (Eds.), *APA handbook of research methods in psychology: Research designs: Quantitative, qualitative, neuropsychological, and biological* (2nd ed., pp. 65–81). American Psychological Association. https://doi.org/10.1037/0000319-004

Brown, J. D. (2011). *Testing in language programs: A comprehensive guide to English language assessment*. Prentice Hall.

Canagarajah, S. (2011). Translanguaging in the classroom: Emerging issues for research and pedagogy. *Applied Linguistics Review*, *2*, 1–28. https://doi.org/10.1515/9783110239331.1

Celce-Murcia, M., Brinton, D. M., & Goodwin, J. M. (2010). *Teaching pronunciation: A course book and reference guide* (2nd ed.). Cambridge University Press.

Chen, X., Li, J., & Zhu, S. (2021). Translanguaging multimodal pedagogy in French pronunciation instruction: Vis-à-vis students' spontaneous translanguaging. *System*, *101*, 102603. https://doi.org/10.1016/j.system.2021.102603

Crowther, D., & Loewen, S. (2025). Instructed second language acquisition and second language pronunciation. *Language Learning, 75*(S1), 30–54. https://doi.org/10.1111/lang.12716

Darcy, I. (2018). Powerful and effective pronunciation instruction: How can we achieve it? *CATESOL Journal*, *30*(1), 13–45.

Deng, Q., & Tong, S. X. (2021). Suprasegmental but not segmental phonological awareness matters in understanding bilingual reading comprehension difficulties in Chinese and English: A 3-year longitudinal study. *Annals of Dyslexia*, *71*(1), 150–169. https://doi.org/10.1007/s11881-021-00213-5

Derakhshan, A., & Wei, L. (2026). Leveraging translanguaging in GenAI-enhanced language classes: Capturing its impact on multilingual English learners' achievement emotions and academic engagement through latent growth curve modelling (LGCM). *International Journal of Multilingualism*. https://doi.org/10.1080/14790718.2025.2610253

Derwing, T. M., & Munro, M. J. (2015). *Pronunciation fundamentals: Evidence-based perspectives for L2 teaching and research*. John Benjamins Publishing Company.

García, O., & Kleifgen, J. A. (2020). Translanguaging and literacies. *Reading Research Quarterly*, *55*(4), 553–571. https://doi.org/10.1002/rrq.286

García, O., & Uysal, H. (2024). *A conversation with Ofelia García: Critical perspectives on translanguaging and adolescent English learners*. *RELC Journal, 55*(1), 274–284. https://doi.org/10.1177/00336882241229249

García, O., Wei, L., 2015. Translanguaging, Bilingualism, and Bilingual Education. In W. E. Wright, S. Boun, O. García, (Eds.). *The Handbook of Bilingual and Multilingual Education* (pp. 223–240). Wiley. https://doi.org/10.1002/9781118533406.ch13

Gilakjani, A. P. (2016). English pronunciation instruction: A literature review. *International Journal of Research in English Education*, *1*(1), 1–6. http://ijreeonline.com/article-1-21-en.html

Gilakjani, A. P. (2012). A study of factors affecting EFL learners' English pronunciation learning and the strategies for instruction. *International Journal of Humanities and Social Science*, *2*(3), 119–128. https://www.academia.edu/download/32894704/17.pdf

Hillenbrand, J., Getty, L. A., Clark, M. J., & Wheeler, K. (1995). Acoustic characteristics of American English vowels. *Journal of the Acoustical*

Society of America, *97*(5, Pt. 1), 3099–3111. https://doi.org/10.1121/1.411872

Huang, X., & Chalmers, H. (2023). Implementation and effects of pedagogical translanguaging in EFL classrooms: A systematic review. *Languages, 8*(3), 194. https://doi.org/10.3390/languages8030194

Huensch, A., & Thompson, A. S. (2017). Contextualizing attitudes toward pronunciation: Foreign language learners in the United States. *Foreign Language Annals*, *50*(2), 410–432. https://doi.org/10.1111/flan.12259

Iskarous, K., & Mooshammer, C. (2021). Coarticulation. In R.-A. Knight & J. Setter (Eds.), *The Cambridge handbook of phonetics* (pp. 106–132). Cambridge University Press.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, *33*(7), 14–26. https://doi.org/10.3102/0013189X033007014

Khonamri, F., Yaqubi, B., & Sokhandan, E. (2022). The potential of translanguaging pedagogy for promoting Iranian bilingual students' English development. *MEXTESOL Journal*, *46*(4), 1–11. https://eric.ed.gov/?id=EJ1374068

Lee, S., Potamianos, A., & Narayanan, S. (2014). Developmental acoustic study of American English diphthongs. *The Journal of the Acoustical Society of America*, *136*(4), 1880–1894. https://doi.org/10.1121/1.4894799

Levis, J. M. (2024). Basics of teaching pronunciation. In A. Guskaroska, Z. Zawadzki, J. M. Levis, K. Challis, & M. Prikazchikov (Eds.), *Teaching pronunciation with confidence*. Iowa State University Digital Press.

Maturana, H. R., & Varela, F. J. (1980). *Autopoiesis and cognition: The realization of the living*. D. Reidel Publishing Company. https://doi.org/10.1007/978-94-009-8947-4

Mayer, R. E., & Moreno, R. (2003). Nine ways to reduce cognitive load in multimedia learning. *Educational Psychologist*, *38*, 43–52. https://doi.org/10.1207/S15326985EP3801_6

Mazzaferro, G. (2018). Translanguaging as everyday practice: An introduction. In G. Mazzaferro (Ed.), *Translanguaging as everyday practice*. Springer.

Munro, M. J., & Derwing, T. M. (2015). The foundations of accent and intelligibility in pronunciation research. *Language Teaching*, *48*(2), 196–215. https://doi.org/10.1017/S0261444811000103

Nazari, M., & Karimpour, S. (2023). Teacher, man mitoonam…?: Translanguaging and English language teacher emotion labor. *Journal of Language, Identity & Education*, 1-15. https://doi.org/10.1080/15348458.2023.2167206

Nosratinia, M., & Zaker, A. (2014). An analysis of Iranian EFL learners' pronunciation errors. *International Journal of Language Learning and Applied Linguistics World*, 5(3), 97–108.

Otheguy, R., García, O., & Reid, W. (2018). A translanguaging view of the linguistic system of bilinguals. *Applied Linguistics Review*, *10*, 625–651. https://doi.org/10.1515/APPLIREV-2018-0020

Otheguy, R., García, O., & Reid, W. (2015). Clarifying translanguaging and deconstructing named languages: A perspective from linguistics. *Applied Linguistics Review*, *6*(3), 281–307. https://doi.org/10.1515/applirev-2015-0014

Pawlak, M. (2025). Explicit and implicit (automatized) knowledge of second language pronunciation: Implications for theory, research, and classroom practice. *Foreign Language Annals, 58*(2), 346–366. https://doi.org/10.1111/flan.12803

Sánchez, M. T., García, O., & Solorza, C. (2018). Reframing language allocation policy in dual language bilingual education. *Bilingual Research Journal*, *41*(1), 37–51. https://doi.org/10.1080/15235882.2017.1405098

Seals, C. A., Newton, J., Ash, M., & Nguyen, B. T. T. (2020). Translanguaging and task-based language teaching: Crossovers and challenges. In Z. Tian, L. Aghai, P. Sayer, & J. L. Schissel (Eds.), *Envisioning TESOL through a translanguaging lens: Global perspectives* (pp. 275–293). Springer.

Seddighi, S. (2010). An account of Iranian EFL pronunciation errors through L1 transfer. *Iranian Journal of Applied Language Studies*, *2*(2), 197–214. https://doi.org/10.22111/ijals.2012.75

Suzukida, Y., & Saito, K. (2022). What is second language pronunciation proficiency? An empirical study. *System, 106*, 102754. https://doi.org/10.1016/j.system.2022.102754

Tang, H., & Peng, Q. (2019). Experimental research in phonics classroom instruction of low-grade elementary students from the perspective of translanguaging. In *Proceedings of the 6th International Conference on Education, Language, Art and Inter-cultural Communication (ICELAIC 2019)*

(*Advances in Social Science, Education and Humanities Research*, Vol. 378, pp. 147–151). Atlantis Press. https://doi.org/10.2991/assehr.k.191217.098

Tong, X., He, X., & Deacon, S. H. (2017). Tone matters for Cantonese–English bilingual children's English word reading development: A unified model of phonological transfer. *Memory & Cognition*, *45*, 320–333. https://api.semanticscholar.org/CorpusID:207632912

Torres, M. C. C., Salamanca, Y. N. S., Cely, J. P. C., & Aguilar, J. L. B. (2020). All we need is a boost! Using multimodal tools and the translanguaging strategy: Strengthening speaking in the EFL classroom. *International Journal of Computer-Assisted Language Learning and Teaching*, *10*(3), 28–47. https://doi.org/10.4018/IJCALLT.2020070103

Wang, X. (2022). Segmental versus suprasegmental: Which one is more important to teach? *RELC Journal*, *53*(1), 194–202. https://doi.org/10.1177/0033688220925926

Wang, F., & Chen, C. (2026). *Translanguaging enjoyment in Thai university classrooms: A Q methodology approach to Chinese language learning*. *Journal of Asian Pacific Communication*. doi:10.1075/japc.25029.wan

Wei, L. (2011). Moment analysis and translanguaging space: Discursive construction of identities by multilingual Chinese youth in Britain. *Journal of Pragmatics*, *43*(5), 1222–1235. https://doi.org/10.1016/j.pragma.2010.07.035

Wei, L., & García, O. (2022). Not a first language but one repertoire: Translanguaging as a decolonizing project. *RELC Journal*, *53*, 313–324. https://doi.org/10.1177/00336882221092841

Wei, L., Phyak, P., Lee, J. W., & García, O. (Eds.). (2025). *The handbook of translanguaging*. Wiley-Blackwell.

Williams, C. (2002). *Ennill iaith: Astudiaeth o sefyllfa drochi yn 11–16 oed* [*A language gained: A study of language immersion at 11–16 years of age*]. School of Education. http://www.bangor.ac.uk/addysg/publictions/Ennill_Iaith.pdf

Williams, C. (1996). Secondary education: Teaching in the bilingual situation. In C. Williams, G. Lewis, & C. Baker (Eds.), *The language policy: Taking stock* (pp. 39–78). CAI Publications.

Zarifi, A., & Sayyadi, A. (2015). How English suprasegmental features of pronunciation are viewed and treated by instructors in Iranian private

language centers. *Theory and Practice in Language Studies*, *5*(6), 1166–1172. https://www.academia.edu/download/37877269/250-964-1-PB.pdf