



STUDENTS' PERCEPTIONS OF THE USE OF ARTIFICIAL INTELLIGENCE-DRIVEN TOOLS FOR ENHANCING EFL PRONUNCIATION

PERCEPCIÓN DE ESTUDIANTES SOBRE EL USO DE HERRAMIENTAS BASADAS EN INTELIGENCIA ARTIFICIAL PARA MEJORAR LA PRONUNCIACIÓN EN INGLÉS

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Abstract

The accessibility of artificial intelligence applications has made autonomous pronunciation practice possible outside any formal instructional framework. This descriptive, cross-sectional, non-experimental quantitative study examined EFL university students' perceptions of their current use of AI-driven pronunciation tools. A



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branched questionnaire organised into sixteen dimensions—among them professional relevance, self-efficacy, accent-related anxiety, autonomy, attitudes towards technology, perceived improvement, feedback quality, phonological awareness, intention to continue, recognition failures, and teacher mediation—was administered on a five-point Likert scale to 49 third-semester students enrolled in an English teaching programme and selected through convenience sampling. Adoption reached 87.8%. Although 77.6% regarded pronunciation as decisive for their professional future, merely 38.8% expressed confidence in their own performance. Perceived improvement proved moderate (53.5%) and declined from segmental accuracy (72.1%) to intelligibility (58.1%). Phonological awareness drew the highest agreement (79.1%), exceeding both perceived improvement and feedback quality (67.4%). Among non-users, 83.3% would adopt these tools under teacher guidance, their barriers proving informational rather than attitudinal. The findings describe perceptions rather than measured performance and indicate that adoption is widespread but unguided, with teacher mediation emerging as the decisive factor.

Keywords: EFL pronunciation; artificial intelligence; learner perceptions; teacher mediation; pre-service teacher education

Resumen

La accesibilidad de las aplicaciones de inteligencia artificial ha hecho posible la práctica autónoma de la pronunciación al margen de todo marco instruccional. El presente estudio cuantitativo, de carácter descriptivo, transversal y no experimental, examinó las percepciones que estudiantes universitarios de inglés como lengua extranjera mantienen respecto de su uso de herramientas de pronunciación basadas en inteligencia artificial. Se administró un cuestionario ramificado, organizado en dieciséis dimensiones —entre ellas la relevancia profesional, la autoeficacia, la ansiedad ante el acento, la autonomía, la actitud hacia la tecnología, la mejora percibida, la calidad de la retroalimentación, la conciencia fonológica, la intención de continuar, los errores de reconocimiento y la mediación docente—, mediante una escala Likert de cinco puntos, a 49 estudiantes de tercer semestre de una carrera de Pedagogía en Inglés seleccionados por muestreo por conveniencia. La adopción alcanzó el 87,8 %. Aunque el 77,6 % consideró la pronunciación determinante para su futuro profesional, apenas el 38,8 % manifestó seguridad respecto de la propia. La mejora percibida resultó moderada (53,5 %) y descendió desde la precisión segmental (72,1 %) hacia la inteligibilidad (58,1 %). La conciencia fonológica concentró el acuerdo más alto (79,1 %), por encima tanto de la mejora percibida como de la calidad de la retroalimentación (67,4 %). Entre los no usuarios, el 83,3 % adoptaría estas herramientas con orientación docente, de modo que sus barreras resultan informativas antes que actitudinales. Los hallazgos describen percepciones y no desempeño medido, e indican que la adopción es masiva pero carece de guía, siendo la mediación docente el factor decisivo.

Palabras clave: pronunciación en inglés como lengua extranjera; inteligencia artificial; percepciones de los aprendices; mediación docente; formación inicial docente

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Introduction

Accurate pronunciation is an essential part of language that ensures intelligibility when communicating. As claimed by Srakaew (2018), pronunciation is viewed as a subskill of speaking that allows one to convey and receive messages successfully. Without it, learners cannot be understood even if they have good grammar and vocabulary repertoire. Furthermore, Sokyrska (2023) posited that mastering good pronunciation can improve self-confidence when speaking and increase students' motivation to participate and engage in meaningful conversations. To communicate effectively, messages must be decoded properly, and this is only possible if pronunciation is clear. Otherwise, mispronunciation can lead to misunderstanding or misinterpreting messages, which can cause frustration and embarrassment (Adinda & Ahmad, 2024).

Pronunciation is the combination of segmental and suprasegmental features while speaking. The segmental domain describes how sounds are uttered, transmitted, and perceived, such as vowels, pure vowels, and consonants. These aspects are observed by the phonetic scope, which explains the utterance of phonemes by placing or moving the tongue, lips, and mouth to generate sounds (Ylianti et al., 2025). Conversely, the suprasegmental features involve length, stress, pitch, intonation, and juncture; all these are important aspects to consider for effective communication. For instance, when stressed differently, words change their meaning: the word *research* /'rɪ:sɜ:rtʃ/ (noun), and /rɪ'sɜ:rtʃ/ (verb) (Nafisa, 2022; Yadgarova, 2023).

However, despite the acknowledged importance of pronunciation, it is frequently overlooked by EFL education programs in contrast to other language elements such as vocabulary, lexicology, and grammar (Nafisa, 2022; Almusharraf, 2022). In Ecuador, school EFL programs focus mainly on teaching grammatical rules and vocabulary memorization, and give little value to activities where students can use the language in real contexts. (Arroba & Acosta, 2021; Orosz et al., 2021). Also, the dearth of training for English teachers influences students' pronunciation since teachers constitute the first English linguistic model to whom learners are exposed in the classroom.

Other factors hindering pronunciation include the phonetic and phonological systems of Spanish and English that differ significantly. Spanish has a system of five vowel sounds, while English has a system with at least twelve vowel phonemes (Almusharraf, 2022). Likewise, insufficient exposure to the target language limits students, and the lack of interaction with authentic material such as real native English speakers hinders them from mastering the correct pronunciation (Nafisa, 2022). This makes EFL pronunciation more challenging and demands continuous practice and instruction.

Over the years, numerous methodologies, strategies, and instructional approaches have been developed to address these pronunciation difficulties in EFL learning. Among these, technology-enhanced tools have become increasingly prevalent in EFL classrooms where teachers try to integrate digital tools in the process of EFL teaching and learning to boost different skills like pronunciation. Many of these technological tools incorporate speech recognition and AI-driven feedback systems that assist learners in identifying and correcting pronunciation errors. More recently, advances in artificial intelligence (AI) have significantly improved the different characteristics of AI by offering human-like speech synthesizers, more accurate voice recognition, accent, etc.



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According to different empirical studies, AI-driven tools have proven to significantly contribute to students' pronunciation improvement due to the integration of features like automatic speech recognition (ASR), natural language processing (NLP), automated, personalized, and immediate feedback, binary verdicts on correctness, accessibility, and the increase of autonomous learning. Apps and websites like ChatGPT, Speechnotes, speechACE, Talk easy, ELSA speak, speechling, Duolingo, Google assistant, etc. integrate the aforementioned properties (Yoo & Ahn, 2024; Han, 2020; Sun, 2023; Akhter, 2025; Kazu & Kuvvetli, 2023; Choi, 2025; Senowarsito & Ardini, 2023; Dennis, 2024).

One of the most relevant features that seems to contribute to pronunciation is automatic speech recognition (ASR). This feature enables AI-driven tools to identify the utterances of students by turning the acoustic signals into digital representations that are compared to trained linguistic models for decoding. Now, with AI algorithms, this feature has notably evolved and improved its accuracy and sensitivity in recognizing the human voice. (Akhter, 2025; Kazu & Kuvvetli, 2023; Choi, 2025; Senowarsito & Ardini, 2023).

Feedback is another characteristic that justifies the use of AI-driven tools in the classroom. Since teachers can hardly provide corrections and feedback to all learners in a classroom, mostly because of time constraints, AI-driven tools prove their effectiveness in allocating immediate, personalized, objective, and automatic feedback on students' pronunciation mistakes. Although the apps cannot provide feedback on prosodic components of speech, they are efficient at addressing corrections on the segmental level (sounds) (Dja'far & Hamidah, 2024; Abdelhalim & Alsehibany, 2025; Yoo & Ahn, 2024; Han, 2020; Sun, 2023).

Despite the aforementioned benefits of AI-driven tools, Xodabande et al. (2025) warn that tools like ChatGPT ought to be used as a complement to human instruction and not as a replacement. The author continues to state that the risk of only relying on AI tools can make students dependent on AI feedback. Hence the need for teachers' mediation. Choi (2025) highlights the importance of the role of teachers to provide emotional encouragement, monitoring of learning trajectories, AI-feedback verification, and real human interaction. Both of the authors state the value of not diminishing the role of teachers but reinforcing it through the assistance of the tools.

Other limitations mentioned in the corpus include weak suprasegmental coverage, voice recognition errors, difficulty interpreting feedback, and pronunciation nuances (Mohammadkarimi, 2024; Abdelhalim & Alsehibany, 2025; Noviyanti, 2020). In spite of these constraints, AI-driven tools are currently being used by university students to leverage automated feedback.

Therefore, this study aims to describe the perceptions of EFL students toward the current usage of AI-driven pronunciation tools at a university level. It seeks to determine their viewpoints towards the importance of mastering good EFL pronunciation for their professional growth, how the integration or non-integration of AI-driven tools has influenced their pronunciation, how effective feedback on pronunciation is provided, and the importance of teacher mediation in their integration.

Materials and Methods

Research approach

This study was conducted under a quantitative approach with a non-experimental design and a cross-sectional approach. It is quantitative as it collected numerical data to analyze the students' perspectives towards the use



of AI-driven tools to improve pronunciation in the EFL. It is non-experimental given that there was no manipulation of the independent variable or intervention with control or experimental groups. Finally, it is cross-sectional as the data collection took place at a single point in time.

This research is descriptive in scope since its purpose is only to characterize and specify the relevant features of the two involved variables. First, an exhaustive revision of the existing literature was done to understand how AI-driven tools help enhance EFL pronunciation according to existing studies (Vu et al., 2025; Noviyanti, 2020; Aljabr, 2025; Xodabande et al., 2025; Mohammadkarimi, 2024; Dja'far & Hamidah, 2024; Abdelhalim & Alsehibany, 2025; Yoo & Ahn, 2024; Han, 2020; Sun, 2023; Kazu & Kuvvetli, 2023; Choi, 2025; Senowarsito & Ardini, 2023; Dennis, 2024).

Participants and sampling

This paper adopted a convenience, non-probabilistic sampling approach, and participation was anonymous and voluntary, with prior consent. The participants were 49 students in the third semester of the Pedagogía de los Idiomas Nacionales y Extranjeros major at Universidad Estatal del Sur de Manabí, Ecuador, in an online modality. This group was selected due to its accessibility and availability. Rather than accounting for a statistically representative sample, it enrolled an accessible classroom. Therefore, the results were not generalized to all University students, but provided evidence of a specific group context.

Techniques and instruments of data collection

The data collection was conducted via an online survey using Google Forms, with a structured questionnaire whose dimensions were based on the literature review. At the moment of designing the survey, there was no information on whether all the students had ever used AI tools to improve their pronunciation accuracy. Consequently, the questionnaire incorporated filter questions that separated users with prior and no prior experience using AI tools to practice their pronunciation. Thus, users indicated their views of using AI to improve EFL pronunciation; no users indicated the reasons why they do not use tools and under what conditions they would.

To ensure comprehension of the questions, the questionnaire was created and administered in Spanish, the respondents' native language. 16 dimensions were identified in the corpus for the creation of the items (questions), which were implemented on a Likert scale: 1= Strongly disagree, 2= disagree, 3=neither agree nor disagree, 4=agree, and 5=strongly agree.

Results and discussion

Learner dispositions toward technology frequently take shape before any formal exposure to it, and the results reported in Table 1 illustrate this asymmetry with clarity, describing a group that trusts technology considerably. Students' attitude toward technology reached the highest mean of the block ($M = 4.27$; $SD = 1.13$), with 85.7% agreement, a result that converges with the acceptance documented throughout the corpus. Dennis (2024) reported that 88% of the participants firmly believed in the effectiveness of the research, and Nguyen et al. (2025) found that almost all respondents regarded the tool as easy to use and beneficial. The numerical coincidence is noteworthy if one considers that those studies measured attitude after a structured intervention, whereas the present data record it without any institutional mediation whatsoever. Favorable disposition, therefore, does not appear to be a product of the intervention but rather a condition preceding it.



Self-efficacy constitutes the central finding of this table. Only 38.8% of the participants declared themselves confident about their pronunciation when speaking in class, with a median located exactly at the neutral point ($Mdn = 3.00$). This result places strain on what the corpus reports, since Han (2020), Choi (2025), and Dennis (2024) document that confidence gains are related to the use of AI tools. The divergence admits two complementary readings. The first concerns design: those studies measured confidence following planned interventions, whereas the present work describes spontaneous and unsupervised use. The observation made by Choi (2025) proves decisive here, given that her own participants reported that a relatively brief period of generative AI use did not suffice to dispel anxiety. The second reading points to Nguyen et al. (2025), in whose study one participant maintained that AI improves pronunciation but not mental confidence. The data obtained are consistent with that distinction, as an adoption rate of 87.8% coexists with a sense of security that fails to reach four out of every ten students.

Anxiety regarding accent obtained 67.3% agreement, and the analysis revealed that this dimension operates independently of self-efficacy. The finding carries theoretical consequences. The literature tends to treat confidence and anxiety as opposite poles of a single affective domain: Yoo and Ahn (2024) and Xodabande et al. (2025) explain the reduction of anxiety through the non-evaluative character of the chatbot, whereas Akhter (2025) contrasts the non-threatening style of the machine with the stress generated by oral tasks performed before peers or teachers. The present results suggest that both dimensions do not covary, since a student may feel competent and nevertheless fear the judgement of others regarding his or her accent. For prospective teachers, such a dissociation matters, because apprehension about accent does not dissolve as perceived competence increases.

Autonomy in practice ($M = 3.84$; 73.5%) converges with the corpus without friction. Akhter (2025) synthesized that in 30 of 36 studies learners reported greater autonomy than with traditional methods, Noviyanti (2020) obtained 86.67% agreement with the statement that the tool sustains independent learning, and Choi (2025) described the transition from following instructions toward autonomous planning. It is nonetheless appropriate to specify the nature of that autonomy. Within the corpus, what is at stake is a scaffolded autonomy: Xodabande et al. (2025) obtained their results through a protocol involving a specific instructional prompt, a printed schedule, and a weekly record of sessions. The autonomy observed in the present sample lacks such scaffolding, and this difference conditions any comparison of results.

Professional relevance displayed the highest dispersion of the instrument ($SD = 1.35$), which reveals a divided group: thirty-two participants selected the maximum score, yet five selected the minimum. Nguyen et al. (2025) reported unanimity in the appraisal of pronunciation, an outcome that they themselves characterized as contrary to their expectations. The analysis further shows that conviction about professional relevance and autonomous practice covary substantially, which identifies a specific subgroup: those who do not acknowledge the relevance do not practice either.

Complementarity between AI and the teacher obtained 75.5% agreement, while the projection of future teaching practice reached 65.3%. The former coincides with what some authors reported in the literature, in which Xodabande et al. (2025) maintain that these tools should complement rather than replace human instruction, and Akhter (2025) recommends accompanying automatic recognition with explicit teacher guidance because learners are unable to identify what triggered a failure. Noviyanti (2020) documents the tension underlying this agreement, as her students valued the application precisely because it substituted for



teacher verification, while the author insisted that technology complements rather than replaces. The present results align with the position of the researchers rather than with that of those students, although 24.5% did not endorse the statement. The gap of nearly ten points between complementarity and projected teaching practice suggests that these prospective teachers adhere to the pedagogical principle more firmly than to their own future professional conduct.

Table 1. Description of the common dimensions according to the use of AI-driven tools to improve EFL pronunciation

Dimension	Items	n	Mean (SD)	Mdn	% agreement
Common dimensions (N = 49)					
Professional relevance	2.1	49	4,18 (1,35)	5,00	77,6
Self-efficacy	2.2	49	3,18 (1,09)	3,00	38,8
Word-tress anxiety	2.3	49	3,55 (1,19)	4,00	67,3
Autonomy in practice	2.4	49	3,84 (1,23)	4,00	73,5
User's attitude towards technology	2.5	49	4,27 (1,13)	5,00	85,7
Complementary between AI and teachers	5.1	49	4,14 (1,16)	5,00	75,5
Teacher projection	5.2	49	3,82 (1,03)	4,00	65,3

Note: In this table, the dimensions considered are those whose items were answered by the two groups: users and non-users.

Perceived improvement obtained a moderate mean ($M = 3.65$; $SD = 0.95$) and an agreement percentage of 53.5%. These values contrast with the magnitude of the effects documented in the literature. Xodabande et al. (2025), in a randomized controlled trial with sixty learners, obtained a difference of nearly six points in favor of the group that practiced with ChatGPT. Nguyen et al. (2025), Senowarsito and Ardini (2023), Han (2020), and Dennis (2024) report significant gains in pronunciation improvement of learners. That almost half of the users in this sample do not claim to have improved can be explained by Mohammadkarimi (2024), whose educators observed that the magnitude of the effect depends on the frequency and regularity of use and that occasional employment yields less perceptible outcomes. The present study contributes convergent evidence, since frequency of use correlated with perceived improvement, so that those who use the tool more assiduously report greater benefits.

The internal gradient of the dimension proves more revealing than its mean. Agreement declined from segmental accuracy (72.1%) toward prosody (62.8%) and intelligibility (58.1%), an ordering that reproduces with remarkable fidelity what the corpus has measured objectively. Abdelhalim and Alsehibany (2025) found very large improvements in segmental pronunciation alongside a complete absence of change in lexical stress, and attributed this pattern to algorithms that emphasize phonemic articulation without consistently detecting prosodic deviations. Senowarsito and Ardini (2023) verified that the application explored primarily segmental features. Therefore, the perception held by the participants of this study is not arbitrary, as it reflects what the tools actually evaluate. The lower agreement concerning intelligibility admits an additional explanation, namely that intelligibility is verified before a human interlocutor, information that no application can return.

The quality of feedback reached 67.4% agreement. The result converges with Nguyen et al. (2025), whose participants almost unanimously declared that they knew exactly which sound they were mispronouncing,



and with Sun (2023), whose learners valued the detection of errors of which they had been unaware. Nevertheless, interpretation demands caution for a reason emerging from the data: twenty-three of the forty-three users declared that they employed ChatGPT or Gemini, and only one mentioned a tool designed specifically to assess pronunciation. Akhter (2025) warns that general-purpose assistants provide implicit feedback, consisting of a failure to recognize the input, instead of the explicit corrective forms characteristic of teacher interaction. It is worth asking what these participants evaluated when appraising the clarity of phonetic feedback, particularly because perceived improvement did not differ between those who used generative AI and those who employed other tools. Xodabande et al. (2025) allow this reading to be qualified, since they demonstrate that ChatGPT produces measurable gains when its use is structured through an explicit protocol.

Phonological awareness registered the highest agreement of the branch (79.1%) and is probably the result best supported by the corpus. Sun (2023) documented that the detection of unnoticed errors heightened self-awareness and responsibility for one's own learning; Akhter (2025) characterized these systems as a mirror of self-awareness and a form of strategic scaffolding, with correction mechanisms that become internalized; and Choi (2025) described the shift from a binary conception of pronunciation toward a nuanced understanding. The convergence suggests that the most consistent contribution of these tools resides not in articulatory improvement but in the transformation of the way learners regard their own production.

Recognition errors obtained 53.5% agreement, a figure indicating that more than half of the users experience failures attributed to their accent. Akhter (2025) provides the technical explanation, noting that these systems are trained predominantly on data from speakers of General American or British English, which generates a feedback barrier for accented speech and adversely affects confidence.

The non-user branch comprised only six cases. The expectation of usefulness was high (83.3%) and adoption conditioned upon the teacher was equally high (83.3%), whereas distrust stood at the midpoint (50.0%) and preference for human interaction obtained the lowest agreement of the entire instrument (16.7%). These non-users, consequently, neither reject the tool nor prefer human contact: they have simply not gained access to it, a fact consistent with the barriers they declared, which referred to unawareness of its existence and to the lack of initial guidance. The corpus does not study non-users, yet it converges on the solution. Xodabande et al. (2025) obtained results with ChatGPT within the framework of a structured protocol involving a schedule and a record of sessions; Akhter (2025) recommends accompanying these tools with explicit teacher guidance; and Aljabr (2025) proposes a deliberate institutional integration. The intermediate distrust of this subgroup is, moreover, well-founded, since Yoo and Ahn (2024) and Abdelhalim and Alsehibany (2025) documented genuine limitations of accuracy, particularly at the prosodic level.

Table 2. Description of the dimensions of users and non-users of AI-driven tools to improve EFL pronunciation

Dimension	Items	n	Mean (SD)	Mdn	% agreement
User branch dimensions (n = 43)					
Perceived learning improvement	4A.3–4A.5	43	3,65 (0,95)	4,00	53,5
Quality of feedback	4A.6–4A.7	43	3,80 (0,95)	4,00	67,4
Phonological awareness	4A.8	43	3,98 (1,08)	4,00	79,1



Intention to continue using the tools	4A.9	43	3,95 (1,11)	4,00	74,4
Speech recognition errors	4A.10	43	3,47 (1,05)	4,00	53,5
Non-user branch dimensions (n = 6)					
Perceived usefulness	4B.2	6	4,00 (1,55)	4,50	83,3
Distrust in accuracy	4B.3	6	3,17 (0,98)	3,50	50,0
Instructor-mediated adoption	4B.4	6	4,00 (1,10)	4,00	83,3
Preference for human interaction	4B.5	6	2,67 (0,82)	2,50	16,7

Note: This table displays the results of the survey administered to users and non-users of AI-driven tools.

Conclusions

Technological uptake in language learning increasingly precedes any curricular decision, and the present findings confirm that pattern: the adoption of artificial intelligence tools for pronunciation practice reaches 87.8% of the participants and occurs spontaneously, without any form of institutional mediation.

Awareness of professional demands does not translate automatically into confidence in one's own performance. Students overwhelmingly acknowledge that pronunciation will prove decisive in their future teaching practice (77.6%), although this dimension displayed the highest dispersion of the instrument, and such conviction covaries with autonomous practice, so that those who do not attribute relevance to it do not practice either. That recognition coexists with low self-efficacy, since barely 38.8% feel confident about their own pronunciation.

The gains reported by learners follow the contours of what the technology is able to assess. Perceived improvement is moderate (53.5%) and declines from the accuracy of individual sounds (72.1%) toward the placement of stress and intonation (62.8%) and intelligibility before other speakers (58.1%), thereby reproducing what the tools effectively evaluate and what they omit. It increases with frequency of use, yet does not differ according to the technical capacity of the system. The highest agreement of the entire branch corresponds to phonological awareness (79.1%), which surpasses both perceived improvement and feedback itself, suggesting that the principal contribution of these technologies resides in self-monitoring rather than in articulatory correction.

Teacher mediation emerges as the decisive factor. More than three-quarters of the sample (75.5%) maintain that artificial intelligence should complement rather than replace the teacher, and 83.3% of the non-users would adopt the tool if it were accompanied by teacher guidance. Their barriers are informational, consisting of unawareness that such tools exist or of how to begin, rather than attitudinal. The study doesn't persuade its students to use artificial intelligence, given that most of them (n=43) already do; it needs to teach them how to choose it and how to read critically what it returns to them.

This study enrolled only 49 students in the same semester and at the same university. The participants were selected by non-probabilistic sampling. Therefore, the results describe this group and can hardly be generalized to all the students of the same major or others in the university. Future research would benefit from broadening the sample across several semesters and institutions, contrasting perceived improvement with objective measures rated by trained judges, and incorporating a qualitative phase that clarifies what those





who report practicing with general-purpose assistants actually do. At the institutional level, it is advisable to develop literacy in the selection of tools and to integrate them through a structured curricular protocol.

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