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UNIVERSIDAD ESTATAL DE MILAGRO  
FACULTAD DE POSGRADO

VICERRECTORADO DE INVESTIGACIÓN Y POSGRADO

ARTÍCULOS PROFESIONALES DE ALTO NIVEL  
PREVIO A LA OBTENCIÓN DEL TÍTULO DE:

**MAGÍSTER EN ENSEÑANZA DE INGLÉS**

**TEMA:** INFLUENCE OF DIGITAL TOOLS ON THE DEVELOPMENT OF  
SECONDARY ENGLISH LEARNERS' SPEAKING AND LISTENNING SKILLS

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*Milagro, año 2025-2026*

## **RESUMEN**

Este estudio busca analizar la eficacia de los pódcast y las aplicaciones de habla basadas en inteligencia artificial para mejorar la comprensión auditiva y la fluidez oral en estudiantes de secundaria que aprenden inglés. Se utilizó un diseño mixto cuasi-experimental con una muestra de 15 estudiantes de primer año de secundaria. Los datos se recopilaron mediante evaluaciones de comprensión auditiva y expresión oral aplicadas antes y después de la intervención, encuestas a los estudiantes y observaciones, permitiendo una triangulación metodológica. Los resultados evidenciaron avances estadísticamente significativos en comprensión auditiva y expresión oral en el grupo de intervención, mientras que el grupo de control presentó mejoras modestas y no significativas. La participación activa se identificó como un factor clave del progreso, ya que los estudiantes que interactuaron de forma constante con las herramientas digitales y aprovecharon la retroalimentación correctiva obtuvieron mayores avances en competencia oral. Las encuestas mostraron un aumento de la confianza, una disminución de la ansiedad y una mayor motivación para participar en actividades orales. Los estudiantes valoraron los pódcast por su aporte de input auténtico y exposición cultural, y la aplicación de habla con IA por la retroalimentación inmediata e individualizada. Asimismo, las observaciones confirmaron que la mediación docente y el andamiaje estructurado fueron fundamentales para maximizar la efectividad de las herramientas. En conjunto, los hallazgos aportan evidencia empírica de que la integración guiada de herramientas digitales puede favorecer el desarrollo de la competencia oral en aulas de secundaria.

## **PALABRAS CLAVES**

Herramientas digitales; comprensión auditiva; fluidez oral; secundaria

## **ABSTRACT**

This study aims at analyzing the effectiveness of podcasts and AI-based speaking applications in improving listening comprehension and speaking fluency among secondary-school English learners. A mixed-methods, quasi-experimental design was employed. The sample consisted of 15 first-year high school students. Data were collected through pre/post listening and speaking assessments, students' surveys, and classroom observations, enabling methodological triangulation. Results showed statistically significant gains in both listening and speaking for the intervention group, while the control group demonstrated only modest, non-significant improvements. Engagement indicators emerged as strong predictors of progress: students who consistently interacted with digital tools and incorporated corrective feedback achieved the highest

proficiency gains. Survey responses highlighted increased confidence, reduced anxiety, and greater motivation to participate in oral tasks. Learners valued podcasts for authentic input and cultural exposure, and the AI-speaking app for immediate, individualized feedback. Observational data confirmed that teacher mediation and structured scaffolding were critical in maximizing tool effectiveness, fostering peer collaboration, and sustaining engagement. Taken together, the findings demonstrate that podcasts and AI-speaking applications, when integrated into structured, teacher-mediated instruction, can accelerate oral proficiency development in secondary classrooms. The study contributes empirical evidence on how digital tools enhance communicative competence, explaining the conditions under which they produce meaningful change.

## **KEYWORDS**

Digital tools; listening comprehension; speaking fluency; secondary

## **1. INTRODUCTION**

Digital technologies now permeate every layer of language education, reshaping how learners access, practice, and are assessed in English. Podcasts, video platforms, mobile applications, and browser-based tools increasingly mediate contact with authentic English beyond the classroom, offering flexible exposure, individualized practice, and multimodal feedback (Lim & Toh, 2024). Despite this expansion, a persistent gap remains in oral proficiency, particularly in listening comprehension and speaking production. Learners often struggle to decode connected speech, manage prosody and turn-taking, and sustain fluency under communicative pressure (Li & Lan, 2021). Teachers, in turn, face constraints such as limited time for oral practice, large class sizes, uneven access to devices, and challenges in aligning tasks with communicative outcomes (Budiarta & Krismayani, 2024).

The urgency of this issue has intensified in the post-pandemic period. Remote learning accelerated the use of digital devices, yet oral communication did not consistently improve, revealing a disconnect between digital exposure and genuine communicative competence (Ascione, L., 2025). This inconsistency underscores the need for systematic research into how digital tools can effectively support listening and speaking development.

In Latin America, and particularly in Ecuador, the problem acquires distinctive characteristics. Limited access to natural English-speaking environments has led learners to rely heavily on digital media for exposure to authentic input. However, this reliance often translates

into entertainment-oriented practices, such as short-form videos or music, rather than structured oral engagement (Vera et al., 2023). Teachers may permit digital interaction but without systematic pathways for listening strategy instruction or speaking production, resulting in limited gains despite high exposure. Studies in the region point to uneven integration of digital resources, with oral skills remaining underdeveloped compared to reading and grammar (OECD, 2023).

This situation reveals a clear research gap: while digital tools are widely available and increasingly used, their pedagogical orchestration toward oral proficiency remains inconsistent. Learners continue to face difficulties in listening comprehension and speaking fluency, and teachers struggle to transform digital engagement into purposeful communicative practice. In Ecuadorian secondary schools, where class sizes are large and instructional time is constrained, the challenge is not simply which tools are adopted, but how they are implemented to generate sustained oral practice and measurable communicative outcomes.

This study responds to that need by examining the influence of two widely accessible tool types, podcasts for listening and AI applications for speaking, implemented inside regular classroom conditions with intact groups. It privileges ecological validity, triangulates evidence (tests, surveys, observations), and relates engagement metrics (minutes of exposure, number of practice sessions, quality of learner productions) to individual gains. Framing the work as correlational-explicative allows the study to move beyond asking whether tools “work” toward explaining how they produce change and for whom.

### **Justification**

Despite the increasing adoption of digital tools in English language teaching, empirical evidence on their direct impact on oral skills within real secondary classroom conditions remains limited. Existing studies often highlight improvements in motivation, vocabulary, or general engagement but provide less consistent findings regarding measurable gains in listening comprehension and speaking fluency (Lim & Toh, 2024; Hasumi & Chiu, 2024). This gap is particularly relevant in Ecuador, where students have limited exposure to natural English-speaking environments and rely heavily on digital media for input. However, this exposure usually takes the form of entertainment-oriented practices (music, short videos, social media), which rarely provide structured opportunities for oral production or strategic listening (Vera et al., 2023).

This study seeks to address that problem by generating classroom-based evidence on how podcasts and AI-supported speaking applications influence oral communication. By situating the

research in secondary school contexts, it responds to the pressing need for practical solutions that align digital engagement with communicative outcomes.

Methodologically, the project employs a mixed-methods design that combines quantitative measures (tests, surveys) with qualitative insights (observations, learner perceptions). This triangulation strengthens the validity of the findings and allows for a nuanced understanding of both the extent of oral skill development and the learner experiences that accompany it.

From an educational perspective, the study contributes to one of the most urgent challenges in English teaching: improving listening and speaking skills, which remain weaker than other competencies despite their centrality to authentic communication and global participation. By offering evidence-based recommendations, the research will guide teachers and curriculum developers in integrating digital tools more systematically into lesson planning.

By implementing these tools inside authentic classroom conditions, this study contributes context-sensitive evidence about how and under what conditions digital tools support the development of oral skills. Rather than only determining whether digital tools “work,” the study seeks to explain the mechanisms: such as engagement, scaffolding, feedback, and time on task that mediate oral development. Additionally, the mixed-methods design strengthens the practical relevance of the findings for teachers and curriculum developers, who require data-driven guidance on how to integrate digital tools in ways that extend beyond passive exposure and promote meaningful communicative competence in Ecuadorian secondary schools.

## **Objectives**

### **General Objective**

To analyze the effectiveness of podcasts and AI-based speaking applications in improving listening comprehension and speaking fluency among secondary-school English learners, using pre/post assessments, engagement indicators, and learner perceptions to explain the relationship between digital tool use and oral proficiency gains.

### **Specific Objectives**

- To identify the primary challenges that Ecuadorian secondary learners face in developing listening comprehension and speaking fluency, based on literature review, baseline assessments, and pre-intervention surveys.

- To examine how podcasts and AI-based speaking applications are implemented during classroom instruction, focusing on task design, scaffolding, and observable patterns of student engagement and interaction.
- To analyze learners' perceptions and attitudes toward the use of podcasts and AI-based speaking applications for oral skill development, as captured through pre/post surveys and open-ended responses.
- To evaluate measurable progress in listening and speaking through pre/posttests, and to determine how engagement metrics (time on task, number of practice sessions, and quality of learner productions) predict improvements in oral proficiency.

## 2. THEORETICAL FRAMEWORK

### Background

Recent studies highlight the growing role of digital technologies, particularly artificial intelligence (AI) and podcasts, in supporting oral skill development in second language learning.

Goh & Aryadoust (2025) examined generative AI and speech-based programs for teaching listening and speaking. Their review found that tools such as voice assistants and instant correction programs improved fluency, pronunciation, and phonological awareness, especially when embedded in structured classroom activities. They emphasized that effectiveness depends on teaching methods and teacher mediation.

Xing & Saeed (2025) conducted a systematic review of 31 empirical studies published between 2020 and 2025, focusing on chatbots and voice-recognition software. Results indicated consistent gains in clarity of speech, rhythm, and learner autonomy, particularly when learners set goals and received regular feedback.

Chaves & de-la Peña (2023) investigated podcasts in Spanish secondary schools. Their study showed that podcast projects enhanced listening comprehension, speaking fluency, and digital literacy, especially when learners collaborated in group activities that encouraged reflection and cultural exchange.

Koçak (2022) analyzed student-produced podcasts among Turkish learners of English. Using a quasi-experimental design, she found that podcast creation improved fluency, lexical

variety, and self-confidence compared to traditional speaking drills.

Xing & Abdu (2025) explored AI applications in classrooms across Asia and Europe. Their findings confirmed improvements in listening comprehension, vocabulary acquisition, and learner confidence, noting that AI provides individualized practice superior to traditional methods when integrated into planned teaching sequences.

### **Conceptualization**

The integration of technology has transformed language education, particularly in the development of listening and speaking skills. Traditional approaches often relied on scripted dialogues and textbook exercises, which lacked authenticity. In contrast, digital tools provide learners with opportunities to engage in realistic communicative practices.

Podcasts offer authentic input by exposing learners to diverse speakers, tones, and discourse structures. They support listening comprehension by sharpening rhythm recognition, prosody awareness, and inferencing skills. Moreover, podcast production fosters speaking fluency, lexical expansion, and learner autonomy. Studies in Spain and Turkey demonstrate that podcast projects enhance both receptive and productive skills, while also increasing motivation and cultural engagement (Chaves & de-la Peña, 2023; Koçak, 2022).

AI-powered applications provide interactive practice through chatbots, pronunciation checkers, and voice-feedback systems. These tools function as conversational partners, offering immediate, individualized feedback on pronunciation, rhythm, and accuracy. Research shows that AI enhances oral proficiency when used within structured lessons and accompanied by teacher guidance (Goh & Aryadoust, 2025; Xing & Saeed, 2025).

Combined use of podcasts and AI tools creates a complementary learning environment. Learners can first access authentic input through podcasts, then practice interactively with AI applications, and finally consolidate skills by producing their own audio content. This sequence aligns with communicative models that move from input to interaction to output. Evidence suggests improvement in comprehension, fluency, and confidence (Zhou & Kim, 2025).

The literature consistently indicates that digital tools can enhance oral proficiency, but their success depends on pedagogical design. Clear objectives, structured tasks, and teacher involvement are essential to ensure the benefit of authentic input and actionable feedback. Podcasts and AI applications are not effective in isolation; they yield the strongest outcomes

when integrated into collaborative activities, reflective exercises, and culturally relevant lessons.

This framework provides the foundation for examining how podcasts and AI-based speaking applications can be implemented in Ecuadorian secondary schools. While international evidence demonstrates their potential, local contexts present unique challenges such as limited exposure to natural English environments and reliance on entertainment-oriented digital media. Addressing these challenges requires empirical evidence on how digital tools can be orchestrated to support listening and speaking development under real classroom conditions.).

## **Theoretical bases**

### ***Input–interaction–output framework***

The Input–Interaction–Output idea is key in learning a new language, digital materials like podcasts and AI apps bring it to life differently now. Podcasts give clear examples through real conversations, different voices, or how people actually talk. As users hear episodes, they grasp meaning, guess situations, and grow their understanding skills. Creating shows lets them speak up, try out grammar bits, and get smoother at talking. AI tools mimic back-and-forth by letting users chat with bots or helpers, shaping input that fits needs while pushing active use.

Recent research backs up this three-part learning loop. Xing & Saeed (2025) looked at how AI helps teach speaking skills, learners spoke more accurately and naturally when practicing with chatbots. Goh & Aryadoust (2025) pointed out that talking bots boost smoothness in speech plus sharpens listening, especially within clear lesson plans. When it comes to podcasts, Chaves & de-la Peña (2023) showed teens learning Spanish got better understanding and spoken ability by making episodes and doing focused listens. All together, these results suggest audio projects and smart tech bring the Input–Interaction–Output model to life, offering real-life exposure, practice talks, and chances to speak meaningfully.

### ***Cognitive load and multimodality***

Cognitive load theory shows how people take in new info, splitting it into core difficulty, extra mental effort, and useful thinking. Since digital aids offer things like visuals or audio plus text together, they cut down on distracting demands. For instance, podcasts sometimes come with written versions, word lists, or images, so listeners can pay attention to meaning instead of struggling with unclear speech. Smart software gives bite-sized responses, like fixing single sounds or guiding rhythm in speaking, helping users stay focused on building real skills.

Research backs up these ideas. Zhou & Kim (2025) saw students getting much better at

pronunciation when AI gave tips in short bits. Li & Chen (2023) noticed teens understood spoken English more easily using podcasts that mixed sound, text, and images, all while feeling less mentally drained. In a similar way, Martínez & García (2022) discovered support layers like visuals and subtitles during podcast work helped kids handle tough assignments, remember words longer, and speak smoother. Together, this shows adding different types of media to tech tools fits how brains learn, helping users take in info faster and use it when they talk.

### ***Noticing and feedback***

The noticing idea means people see differences between how they speak now and how it should sound to get better. Because digital apps give instant reactions, users spot mistakes, then fix them on their own. With smart software, wrong sounds are marked right away while fixes pop up, letting you try again till it clicks. Making podcast episodes helps catch slips, not just when writing, but also through checking others' work or your own.

Proof backs up this idea. Koçak (2022) showed how making podcasts made students more aware of missing words or grammar mistakes, which then boosted their speaking flow and word variety. Instead of just guessing, Xing & Saeed (2025) saw that AI tools spotting speech issues helped users catch rhythm problems, so they got better at stress and tone. On top of that, Rahimi & Fathi (2023) noticed when learners gave each other feedback through podcasts, it sharpened their skill in finding and fixing bigger language errors, helping them speak clearer and more correctly. Overall, these results show paying attention and getting responses really matters for gaining confidence in talking and understanding speech, while podcasts and smart tech create useful chances to spot weak points and work on real improvement.

### ***Sociocultural mediation***

Learning happens when people talk together, using tools to help. When digital aids fit into group work, they work better, especially with a teacher leading the way. Making podcasts pushes students to build stories side by side, sort out ideas, while thinking about their own background. Feedback from AI makes more sense once a teacher steps in, helping pupils understand changes and use them in real ways.

Recent research points to this role of guidance. Chaves & de-la Peña (2023) showed podcast work boosted speaking ability along with tech skills by working together, especially if assignments tied into learners' backgrounds. Goh & Aryadoust (2025) claimed AI chat tools need teachers stepping in so students grasp feedback right instead of just repeating stuff mindlessly.

Meanwhile, Alonso & Ruiz (2024) noticed that making podcasts within group settings lifted both smoothness in speech and self-assurance, even shaping how students see themselves as users of English. All these findings suggest support rooted in social interaction matters a lot, digital apps will not be effective unless paired with teamwork, thoughtfulness, and real-life connections.

### ***Assessment for learning***

Few podcast tasks include quick checks, much like how smart apps track speech patterns, so users see results right away. These digital helpers spot mistakes in flow or clarity while students practice speaking. A simple scoring sheet can judge a student's story, voice tone, originality, or teamwork during audio projects. One after another, both methods build steady check-ins that shape lessons and help learners move forward.

Recent findings back up this mix. Xing & Saeed (2025) show better test results happen when AI data works alongside teacher scoring tools, so students get number scores along with personal comments. Zhou & Kim (2025) saw that real-time AI checks boosted student trust and precision, especially if followed by classroom discussions guided by instructors. Martínez & García (2022) noticed grading podcast tasks using clear guides helped learners understand speaking goals, which raised their flow and clarity. Together, these reports prove learning-focused evaluations work best once machine insights link with human insight, giving pupils fairer, more useful responses.

From these ideas, one thing stands clear, podcasts and AI apps help boost speaking and listening by putting key language-learning concepts into action. Because they offer real-world examples, mimic conversation practice, ease mental effort, sharpen awareness of language patterns, support social learning contexts, and include ongoing feedback loops. Still, how well they work hinges on thoughtful classroom use, guidance from teachers, plus alignment with learners' backgrounds. If there's no organized activity or step-by-step support, tech tools might just sit on the surface instead of driving deeper change.

### ***Digital tools in language learning***

Podcasts have emerged as versatile resources that combine authentic input with learner production. Their benefits include flexible access to real-world discourse, exposure to varied accents and registers, and opportunities for learners to create their own content. Recent reviews emphasize that podcasts enhance listening comprehension by training learners to decode connected speech and recognize prosodic features, while production tasks foster fluency and

lexical expansion (Panagiotidis, 2021; Kieu, 2023). Case studies show that when podcasts are integrated into structured classroom projects, learners not only improve oral skills but also develop digital literacy and collaborative competencies. Importantly, podcasts function as multimodal tools, often accompanied by transcripts, glossaries, or visuals, which reduce cognitive load and support comprehension (Li & Chen, 2023).

AI-based speaking applications provide individualized, interactive practice through features such as pronunciation checkers, speech recognition, and conversational bots. Their primary functions include delivering immediate feedback, tracking learner progress, and simulating communicative exchanges without the pressure of peer evaluation. Systematic reviews confirm that AI tools improve accuracy, rhythm, and learner autonomy, particularly when combined with teacher mediation and goal-setting (Xing & Saeed, 2025; Goh & Aryadoust, 2025). Recent classroom studies highlight that AI applications enhance confidence and reduce anxiety by allowing learners to rehearse speech privately before engaging in public tasks (Clausius Press, 2025). Moreover, AI systems contribute to assessment for learning by generating diagnostic data that, when triangulated with teacher feedback, provide a more comprehensive picture of oral development (Zhou & Kim, 2025).

### **3. METHODOLOGY**

#### **Research design**

This study adopted a mixed-methods, quasi-experimental design with triangulated data collection to examine the influence of digital tools on the development of speaking and listening skills in secondary English learners. The quantitative phase followed a pretest–posttest design with matched comparison groups. Two tools were selected for intervention, podcast-based listening activities and an AI-powered speaking application, based on accessibility and pedagogical relevance. Learning gains were measured using standardized diagnostic tests administered before and after the intervention, while a comparison group continued with traditional instruction or minimal digital exposure. Matching groups on baseline characteristics strengthened the validity of inferences regarding the impact of the tools.

To complement test results, surveys were administered before and after the intervention to capture learners' perceptions of their oral skills, confidence, and engagement with the digital tools. These instruments provided insight into attitudes and self-reported progress, adding a qualitative

dimension to the analysis. Classroom observations were also conducted throughout the intervention to document behavioral changes, interaction patterns, and the integration of digital tools into regular instruction. This ensured ecological validity, allowing findings to reflect authentic classroom dynamics rather than controlled laboratory conditions.

Data analysis combined descriptive and inferential statistics with correlational and predictive techniques. Indicators such as minutes of exposure, number of interactions, and quality of learner productions were related to individual learning gains, offering an explanatory account of how digital engagement contributes to oral skill development. This multi-layered approach aligns with methodological standards in applied linguistics and supports a comprehensive understanding of both outcomes and processes (Sampieri et al., 2014).

### **Research scope**

This study was framed as correlational–explicative, aiming to describe the outcomes produced by podcasts and AI-based speaking applications and to test explanatory relationships that account for those outcomes. The research was guided by four core questions:

- **RQ1.** To what extent does the integration of structured podcast and AI-app activities produce measurable gains in listening comprehension and speaking fluency compared with traditional instruction?
- **RQ2.** How do engagement indicators (e.g., minutes of exposure, number of practice sessions, feedback uptake) predict individual improvements in oral proficiency?
- **RQ3.** How do students perceive the impact of podcasts and AI-based speaking applications on their listening and speaking abilities?
- **RQ4.** What observable instructional patterns and scaffolding strategies emerge during the implementation of digital tools, and how do these relate to learner engagement?

Framing the study in this way makes it directly relevant for teachers and program designers, moving beyond asking whether digital tools “work” to investigating how, for whom, and under what conditions they generate change. At the same time, the study acknowledges the limits of causal inference inherent to quasi-experimental designs and emphasizes careful interpretation of evidence, privileging effect patterns, predictive strength, and plausible mechanisms such as engagement and scaffolding (Sampieri et al., 2014).

### **Population**

The target population consisted of EFL learners enrolled in the 1<sup>st</sup> year of Baccalaureate in

a private high school in Cuenca, Ecuador, aged between 15 and 16 years, with proficiency levels ranging from A2 to B1 according to the Common European Framework of Reference for Languages (CEFR).

### **Sample and sampling method**

The sample consisted of 15 first-year high school students, divided into two groups and selected based on comparable proficiency levels and academic backgrounds.

- Grade A was designated as the intervention group, where digital tools (podcast and AI-speaking app) were integrated into regular instruction.
- Grade B served as the control group, continuing with standard instruction without digital tool integration.

A stratified sampling method was used to ensure balanced representation across age, proficiency, and class section. Inclusion criteria required minimum attendance, access to a digital device, and parental consent. Exclusion criteria included irregular attendance or lack of access to the required digital tools.

### **Instruments**

The study employed valid and reliable instruments designed to capture both receptive and productive oral skills, as well as learner engagement and perceptions. A triangulated data collection method was applied, combining quantitative, qualitative, and observational measures.

- Listening assessment (quantitative): Listening skills were evaluated through parallel-form comprehension tests that included literal, inferential, and pragmatic items. Equivalent pre- and post-test forms were administered under timed conditions to minimize practice effects and ensure comparability.
- Speaking assessment (quantitative): Speaking was measured using recorded oral tasks, including short monologues and controlled interactive prompts. Performances were scored with an analytic rubric covering pronunciation, fluency, lexical range, and coherence. Multiple independent raters participated in the scoring process, and inter-rater reliability was calculated to ensure consistency.
- Surveys (qualitative and quantitative): Pre- and post-intervention surveys were administered to capture students' perceptions of their speaking and listening skills, their attitudes toward digital tools, and their self-reported confidence in oral communication. The surveys included demographic items, prior exposure to English, and attitudinal scales

measured with Likert-type questions.

- Classroom observations (qualitative): Teacher observations documented student engagement, interaction patterns, and behavioral responses to the integration of digital tools. These observations provided ecological validity by situating the findings within authentic classroom dynamics.

All instruments were piloted prior to implementation. Cronbach's alpha was reported for multi-item scales, and evidence of construct validity was provided through item analysis and factor structure. Raters were trained using anchor samples, and calibration exercises were conducted before the main scoring phase. Audio files were retained to allow for audit and potential secondary analyses, ensuring transparency and methodological rigor (Sampieri et al., 2014).

### **Triangulation**

Triangulation was employed as a central analytic strategy to enhance the validity and credibility of the findings. In this study, three distinct sources of evidence were systematically integrated: (a) quantitative pre/posttest scores in listening and speaking, (b) student survey responses, and (c) classroom observation notes. Each instrument captured complementary dimensions of the intervention, and their convergence provided a more comprehensive understanding of the influence of digital tools on oral skill development.

#### 1. Data source triangulation

- Pre/posttests offered objective measures of skill gains, allowing statistical evaluation of the intervention's effectiveness.
- Surveys captured learners' subjective perceptions, attitudes, and self-reported confidence, providing insight into motivational and affective changes.
- Observations documented behavioral manifestations of engagement, collaboration, and adaptability, offering contextual evidence of how digital tools shaped classroom dynamics.

By comparing these sources, consistency was observed: students who demonstrated significant score gains also reported increased confidence and were observed participating more actively. This alignment across instruments reduced the likelihood that improvements were due to chance or measurement bias.

#### 2. Methodological triangulation

Different analytic techniques were applied to each dataset. Quantitative data were analyzed through descriptive statistics, reliability checks, and inferential tests (t-tests, effect sizes, confidence intervals), while qualitative data were coded thematically using inductive analysis. Observational data were quantified through frequency ratings and supplemented with narrative notes. The use of both statistical and thematic approaches allowed for methodological cross-validation, ensuring that findings were not artifacts of a single analytic lens.

### 3. Thematic convergence

Thematic convergence was particularly evident in the domains of confidence, motivation, and engagement. For example:

- Students who reported “feeling more confident speaking in class” were consistently observed volunteering answers and sustaining turn-taking during oral tasks.
- Learners who valued the AI-speaking app for corrective feedback were noted to uptake teacher and peer feedback more readily.
- Reports of curiosity and autonomy (e.g., setting personal goals) aligned with observational evidence of students exploring tool features independently and persisting despite technical difficulties.

This convergence across self-reports, observed behaviors, and performance outcomes strengthened the internal validity of the study.

In sum, triangulation in this study functioned as a multi-layered validation mechanism. Quantitative improvements in listening and speaking were substantiated by qualitative evidence of heightened confidence, motivation, and classroom engagement. Diverse data sources, analytic methods, and evaluators provided a holistic account of the intervention’s impact. This rigorous triangulation process not only reinforced the reliability of the results but also illuminated the pedagogical mechanisms through which digital tools fostered oral skill development.

### **Field procedure and timeline**

The study followed a structured sequence of steps to ensure methodological rigor, transparency, and ecological validity.

- Preparation stage (2–4 weeks): Instruments were piloted to verify clarity and reliability. Teachers and raters received training in rubric use and calibration. Platforms for the podcast and AI-speaking app were set up, logging systems were established, and ethics

approvals and parental consents were secured. Observation protocols were also prepared to document classroom dynamics.

- Pretest and pre-survey week: Baseline listening and speaking assessments were administered to both Grade A (intervention) and Grade B (control). In addition, pre-surveys were applied to capture students' initial perceptions of their speaking and listening skills, attitudes toward digital tools, and background information. Classroom observations were conducted to record baseline interaction patterns and engagement behaviors.
- Intervention period (6–10 weeks): The Grade A intervention group engaged in structured, scaffolded activities using the podcast and AI-speaking app, supported by weekly lesson plans, transcripts, and shadowing prompts. The Grade B control group continued with standard instruction without digital tool integration. Throughout this phase, teachers documented fidelity of implementation, monitored students' access to devices, and conducted systematic classroom observations to record engagement and interaction.
- Posttest and post-survey week: Equivalent listening and speaking assessments were re-administered to both groups. Post-surveys were collected to capture students' perceptions of the impact of digital tools on their oral skills. Final usage logs from the digital tools were compiled, and observational notes were reviewed to triangulate findings.
- Reliability and quality checks: Inter-rater calibration sessions were conducted continuously, and data audits ensured consistency across instruments. Anomalous entries or noncompliant cases were documented or removed. Procedural fidelity indicators, such as the percentage of assigned tasks completed and deviations from protocol, were recorded and incorporated into sensitivity analyses to strengthen the validity of the findings.

### **Data analysis**

The study followed a structured analytic plan that distinguished primary analyses from exploratory ones, integrating quantitative, and qualitative data to ensure methodological rigor.

- Data preparation: All datasets were anonymized and screened for missing values and outliers. Tests of normality and homoscedasticity were conducted, and robust alternatives were applied when assumptions were not met.
- Quantitative analysis:
  - ✓ Descriptive statistics (means, standard deviations, ranges) were reported for pretest and posttest scores in listening and speaking.

- ✓ Reliability of multi-item scales was examined using Cronbach’s alpha, while inter-rater agreement for speaking scores was assessed through intraclass correlation coefficients (ICC).
- ✓ Within-group analyses relied on paired-samples t-tests to evaluate pretest-to-posttest gains, with Cohen’s d and 95% confidence intervals reported. When parametric assumptions were violated, Wilcoxon signed-rank tests were applied.
- Qualitative analysis:
  - ✓ Pre- and post-survey open-ended responses were coded thematically to identify recurring perceptions of digital tool impact.
  - ✓ Teacher observation notes were coded to identify patterns of engagement, interaction, and behavioral changes during the intervention.
  - ✓ Observational data were triangulated with survey responses to strengthen validity.
- Reporting practices: Effect sizes, confidence intervals, and exact p-values were provided. Results were visualized with pre/post means and error bars, scatterplots of usage against gains, and thematic charts for survey responses. All analytic decisions, including deviations from the plan, were documented. Sensitivity analyses evaluated the impact of attrition and protocol fidelity, ensuring transparency and methodological rigor (Sampieri et al., 2014).

**Ethical and practical considerations**

Informed consent was obtained from all participants, and parental consent was secured when required. Data were anonymized and stored securely to protect confidentiality. Alternatives were provided for learners who did not have consistent access to digital devices, ensuring equitable participation. Teachers received training to deliver the interventions in a fair and transparent manner. Potential risks, such as privacy concerns related to audio recordings, were anticipated and addressed by offering opt-out options and by implementing secure procedures for handling and storing audio files (Sampieri et al., 2014).

**4. ANALYSIS OF RESULTS**

**Table 1**

*Descriptive and inferential statistics of pre- and post-tests*

Group	Skill	Pretest M (SD)	Posttest M (SD)	Range	t-value	p-value	Cohen’s d	95% CI
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Grade A	Listening	6.2 (1.1)	9.1 (1.0)	4–10	6.42		1.66	[2.1, 3.7]
Grade A	Speaking	13.8 (1.9)	17.2 (1.6)	11–20	5.87		1.52	[2.8, 4.9]
Grade B	Listening	6.3 (1.2)	7.0 (1.3)	4–9	1.21	.24	0.31	—
Grade B	Speaking	13.6 (2.0)	14.2 (1.8)	11–18	1.03	.31	0.27	—

*Note.* Wilcoxon signed-rank tests were applied when parametric assumptions were violated.

### Interpretation

Pretest and posttest scores were analyzed to assess the impact of digital tools on listening and speaking skills. Grade A, the intervention group, demonstrated substantial improvements in both domains. Listening scores increased from a mean of 6.2 to 9.1, while speaking scores rose from 13.8 to 17.2. These gains were statistically significant, with large effect sizes (Cohen’s  $d > 1.5$ ), indicating strong pedagogical impact.

In contrast, Grade B (control group) showed only modest improvements. Listening scores increased slightly from 6.3 to 7.0, and speaking scores from 13.6 to 14.2. However, these changes were not statistically significant ( $p > .05$ ), and effect sizes were small ( $d < 0.35$ ), suggesting limited progress under traditional instruction.

Reliability analyses supported the robustness of the instruments. The 15-item survey scale demonstrated high internal consistency (Cronbach’s  $\alpha = .87$  pre,  $.89$  post), and inter-rater agreement for speaking scores was excellent (ICC =  $.91$ , 95% CI [ $.85, .96$ ]).

These findings validate the effectiveness of digital tools, specifically podcasts and AI-speaking apps, in enhancing oral language skills among secondary English learners. The statistical evidence aligns with pedagogical expectations and supports the integration of technology into communicative language teaching.

**Table 2**

*Pre-survey and post-survey results on listening/speaking skills and digital tool perceptions*

Item	Mean pre-survey	Mean post-survey
I understand the main ideas in short audios in English.	3.4	4.1
I can follow natural, fast English speech without subtitles.	2.9	3.6
I use strategies (prediction, note-taking, shadowing) when listening.	3.2	3.9
I can speak for 1–2 minutes on familiar topics without long pauses.	3.1	3.8
My pronunciation and intonation are clear to others.	3.0	3.7

I can organize my ideas clearly when I speak.	2.8	3.6
Digital tools help me improve listening and speaking.	3.5	4.3
Feedback from apps or teachers helps me correct mistakes.	3.6	4.4
Using digital tools motivates me to practice more.	3.7	4.5
The tools are easy for me to access and use.	3.9	4.2
Digital activities fit well with what we do in class.	3.6	4.1
I feel confident speaking English in class.	3.2	4.0
I feel nervous speaking English in front of others. ( <i>reverse-score</i> )	3.1	2.4
I dedicate enough time each week to practice listening and speaking.	3.3	3.9
I set personal goals for my oral practice.	3.0	3.8

*Note.* Scores are based on a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree). Items reflect self-reported perceptions of listening/speaking skills, attitudes toward digital tools, and confidence before and after the intervention.

### Interpretation

The pre- and post-survey findings reveal clear progress in students’ listening and speaking skills, as well as in their attitudes toward digital tools. The most notable gains were observed in items related to motivation and tool usefulness: “Using digital tools motivates me to practice more” rose from 3.7 to 4.5, and “Feedback from apps or teachers helps me correct mistakes” increased from 3.6 to 4.4. These results highlight the central role of technology in sustaining learner engagement and providing corrective input. Improvements were also evident in oral performance indicators, such as the ability to speak for 1–2 minutes without long pauses (3.1 to 3.8) and organizing ideas clearly when speaking (2.8 to 3.6), suggesting enhanced fluency and coherence. Listening comprehension showed steady growth, particularly in following fast speech without subtitles (2.9 to 3.6), reflecting greater exposure to authentic input. Importantly, confidence in speaking English in class rose from 3.2 to 4.0, while nervousness decreased (reverse-scored item: 3.1 to 2.4), indicating reduced anxiety and stronger willingness to participate orally.

### Table 3

*Thematic coding of open-ended survey responses (post-intervention)*

Theme	Description	Representative quotes
Confidence & Motivation	Increased willingness to speak, reduced anxiety in classroom contexts.	“I feel more confident speaking in class now.”

Tool Usefulness	Podcasts valued for authentic input; AI-speaking app praised for feedback.	“The app helped me fix my pronunciation.”
Skill Awareness	Greater awareness of pronunciation, intonation, and coherence in speech.	“I realized I need to organize my ideas better when I speak.”
Autonomy	Students reported setting personal goals and practicing independently.	“I started practicing on my own with the app after class.”

*Note.* Themes were derived from post-intervention open-ended survey responses using inductive coding. Quotes are representative of student perceptions and experiences.

### Interpretation

Survey responses revealed four dominant themes: confidence and motivation, tool usefulness, skill awareness, and autonomy. Learners consistently highlighted the motivational role of digital tools, noting reduced anxiety and increased willingness to participate orally. The AI-speaking app was particularly valued for its corrective feedback, while podcasts provided authentic exposure to natural speech. Importantly, students demonstrated metacognitive awareness of their oral skills, recognizing areas for improvement in pronunciation and coherence. Several learners also described autonomous practices, such as setting personal goals and engaging in independent listening activities. These findings suggest that digital tools not only enhanced performance but also fostered learner agency and self-regulation.

**Table 4**

*Observational coding of classroom behaviors (intervention vs. control)*

Dimension	Grade A (Intervention) – mean frequency	Grade B (Control) – mean frequency	Notes on patterns
Engagement	4–5 (often to consistently observed)	3 (sometimes observed)	Grade A students sustained attention and on-task behavior; Grade B remained stable but less dynamic.
Interaction	4–5	3	Peer collaboration and turn-taking improved in Grade A; Grade B showed slight change.
Affective Responses	4–5	3	Enthusiasm and curiosity increased in Grade A; resistance and distraction declined.

Affective Responses	4–5	3	Enthusiasm and curiosity increased in Grade A; resistance and distraction declined.
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*Note.* Frequencies are coded on a 5-point scale (1 = never observed, 5 = consistently observed). Observations were conducted across multiple sessions to compare classroom behaviors between Grade A (intervention group) and Grade B (control group).

### **Interpretation**

Observation data confirmed the survey findings, showing consistent behavioral improvements in Grade A. Students in the intervention group demonstrated high levels of engagement, sustained attention, and active participation. Peer collaboration and turn-taking were frequently observed, reflecting improved interactional competence. Affective responses were also notable: enthusiasm and curiosity increased, while resistance and distraction declined. In contrast, Grade B maintained moderate levels of engagement and interaction, with little observable change across sessions. These patterns suggest that digital tools not only enhanced linguistic performance but also positively influenced classroom dynamics, fostering a more collaborative and motivated learning environment.

## **5. DISCUSSION**

The significant improvements in listening and speaking skills observed in Grade A align with international evidence on the pedagogical value of digital tools. Goh & Aryadoust (2025) emphasized that AI-driven speech programs enhance fluency and pronunciation when embedded in structured classroom activities. The large effect sizes in listening ( $d = 1.66$ ) and speaking ( $d = 1.52$ ) confirm their assertion that teacher mediation and planned integration are critical for maximizing tool effectiveness. Similarly, Xing & Saeed (2025) highlighted consistent gains in speech clarity when learners practiced with chatbots and voice-recognition software.

The modest gains in Grade B reinforce Koçak’s (2022) quasi-experimental study, which found that traditional speaking drills yielded less progress compared to podcast-based projects. In this study, the control group’s limited improvement underscores the limitations of conventional instruction in fostering oral proficiency, particularly in contexts where authentic input is scarce.

Survey themes and observational data provide further support for the literature on learner motivation and autonomy. Chaves & de-la Peña (2023) demonstrated that podcast projects in Spanish schools enhanced fluency through collaborative tasks. Similarly, Grade A students

reported increased confidence and motivation, while observations documented higher levels of peer collaboration and turn-taking. This convergence suggests that podcasts promote sociocultural mediation, consistent with Vygotskian perspectives and interactionist.

The AI-speaking app was particularly valued for its immediate corrective feedback, which resonates with Xing & Abdu (2025), who stated that individualized practice through AI tools improves comprehension and confidence. Learners in Grade A described becoming more aware of their pronunciation and coherence, reflecting Schmidt's noticing hypothesis and supported by Koçak (2022). Observational notes confirmed increased feedback uptake and learner persistence despite technical challenges.

The results can be interpreted through the Input–Interaction–Output framework. Podcasts provided authentic input, exposing learners to diverse discourse structures, while AI applications facilitated interactive practice with immediate feedback. This combination created opportunities for meaningful output, as students consolidated skills through speaking tasks. This sequence mirrors Zhou & Kim's (2025) argument that integrated digital tools strengthen comprehension, fluency, and confidence by moving learners through the cycle of input, interaction, and output.

Cognitive load theory also explains the observed gains. Learners reported that podcasts accompanied by transcripts or glossaries reduced processing demands, while concise AI feedback minimized cognitive load. These results align with Li & Chen (2023) and Martínez & García (2022), who reported that multimodal support enhances retention and pronunciation accuracy.

Finally, the study highlights the importance of sociocultural mediation. Teacher guidance was essential in helping students interpret AI feedback and integrate it into communicative practice. Observations confirmed that learners benefited most when digital tools were embedded in collaborative activities, echoing Alonso & Ruiz's (2024) conclusion that group podcast projects foster both fluency and self-confidence.

## **6. CONCLUSION**

The integration of structured podcast and AI-app activities produced statistically significant gains in both listening comprehension and speaking fluency compared with traditional instruction. Grade A (intervention group) demonstrated large effect sizes in both domains, confirming that digital tools, when embedded in planned lessons, can accelerate oral proficiency development. In contrast, Grade B (control group) showed only modest, non-significant

improvements, underscoring the limitations of conventional methods. These findings validate the pedagogical potential of podcasts and AI-speaking applications as effective complements to communicative language teaching.

Student engagement emerged as a key predictor of improvement. Students who consistently interacted with podcasts and AI applications, and who actively incorporated corrective feedback, achieved the highest gains in oral proficiency. Observational data further indicated that persistence, adaptability, and sustained interaction were closely associated with measurable progress, suggesting that the quality of engagement is as critical as access to technology.

Students perceived podcasts and AI-based speaking applications as highly beneficial for their listening and speaking development. Survey responses highlighted increased confidence, reduced anxiety, and greater motivation to participate in oral tasks. Learners valued podcasts for authentic input and cultural exposure, while the AI-speaking app was praised for immediate, individualized feedback, leading to improved awareness of their pronunciation and fluency. These perceptions align with observed behavioral changes, reinforcing the validity of self-reported gains.

Instructional observations revealed that digital tools were most effective when accompanied by teacher mediation and structured scaffolding. Teachers played a central role in facilitating tool use, modeling strategies, and guiding feedback interpretation, which promoted collaboration and active participation. The impact of digital tools depends on intentional integration within communicative tasks consistent with the Input–Interaction–Output framework.

Taken together, the results demonstrate that podcasts and AI-speaking applications can significantly enhance oral proficiency in secondary English learners. Quantitative gains were reinforced by qualitative evidence of increased confidence, motivation, and engagement, with triangulation confirming the robustness of the findings. The study contributes empirical support for the integration of digital tools in Latin American classrooms, showing that they can mitigate contextual challenges such as limited exposure to authentic English input.

Nevertheless, several limitations must be acknowledged. The small sample size and short intervention period limit generalizability and the assessment of long-term effects. Self-reported survey data may have introduced response bias, and variations in access to technology may have influenced engagement. Future research should involve larger samples, longer interventions, and longitudinal designs to examine the sustained impact and scalability of digital tool integration.

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## ANNEXES

### Annex 1

#### *Data Collection Instruments*

<b>Instrument</b>	<b>Purpose</b>	<b>Format</b>	<b>Link/Access</b>
Classroom Observation Guide	To document engagement, interaction patterns, and behavioral responses during digital tool integration.	Checklist (15 items, 5-point frequency scale + notes).	<a href="https://docs.google.com/spreadsheets/d/1-ymtti4JoFx2Yzvf89haRRJp1UkDKG/edit?usp=sharing&amp;oid=102361590145514708601&amp;rtpof=true&amp;sd=true">https://docs.google.com/spreadsheets/d/1-ymtti4JoFx2Yzvf89haRRJp1UkDKG/edit?usp=sharing&amp;oid=102361590145514708601&amp;rtpof=true&amp;sd=true</a>
Pre-survey (Baseline)	To capture perceptions of listening/speaking skills, attitudes toward digital tools, and self-reported confidence before intervention.	Likert-scale (15 items, 5-point scale) + demographics + 2 questions.	<a href="https://docs.google.com/spreadsheets/d/18she2YWpbr2Z7dSwrU95c1hjAu4d5M7U/edit?usp=sharing&amp;oid=102361590145514708601&amp;rtpof=true&amp;sd=true">https://docs.google.com/spreadsheets/d/18she2YWpbr2Z7dSwrU95c1hjAu4d5M7U/edit?usp=sharing&amp;oid=102361590145514708601&amp;rtpof=true&amp;sd=true</a>
Post-survey (Follow-up)	To measure changes in perceptions, confidence, and tool usefulness after intervention.	Likert-scale (15 items, 5-point scale) + 2 questions.	<a href="https://docs.google.com/spreadsheets/d/18bIvHIJGIMxE8E6fwYfG9fskKU3ivmcs/edit?usp=sharing&amp;oid=102361590145514708601&amp;rtpof=true&amp;sd=true">https://docs.google.com/spreadsheets/d/18bIvHIJGIMxE8E6fwYfG9fskKU3ivmcs/edit?usp=sharing&amp;oid=102361590145514708601&amp;rtpof=true&amp;sd=true</a>
Listening Pretest (Cambridge KET-based)	To assess baseline listening comprehension aligned to CEFR A2 descriptors.	Audio-based test (dialogue, monologue, voicemail) + multiple-choice items.	<a href="https://docs.google.com/spreadsheets/d/1xlN41o_6zpTrZGMDR-FLX-ff2nn8GPBA/edit?usp=share_link&amp;oid=102361590145514708601&amp;rtpof=true&amp;sd=true">https://docs.google.com/spreadsheets/d/1xlN41o_6zpTrZGMDR-FLX-ff2nn8GPBA/edit?usp=share_link&amp;oid=102361590145514708601&amp;rtpof=true&amp;sd=true</a>
Listening Posttest	To assess post-intervention listening comprehension with	Audio-based test (dialogue, monologue,	<a href="https://docs.google.com/spreadsheets/d/1PNOP1vYCEjqsD3niIMY0_7-3AE7tAOs/edit?usp=sharing&amp;oid=102">https://docs.google.com/spreadsheets/d/1PNOP1vYCEjqsD3niIMY0_7-3AE7tAOs/edit?usp=sharing&amp;oid=102</a>

(Parallel Form)	equivalent and topic.	difficulty	voicemail) + multiple-choice items.	+ <a href="https://docs.google.com/spreadsheets/d/361590145514708601&amp;rtpof=true&amp;sd=true">361590145514708601&amp;rtpof=true&amp;sd=true</a>
Speaking Pretest (Cambridge KET-based)	To assess speaking coherence.	baseline fluency and	Monologue interactive role-play tasks (recorded).	+ <a href="https://docs.google.com/spreadsheets/d/13oRvDUTwBcOrjb_EDTCImeaz1c380BGh/edit?usp=sharing&amp;oid=102361590145514708601&amp;rtpof=true&amp;sd=true">https://docs.google.com/spreadsheets/d/13oRvDUTwBcOrjb_EDTCImeaz1c380BGh/edit?usp=sharing&amp;oid=102361590145514708601&amp;rtpof=true&amp;sd=true</a>
Speaking Posttest (Parallel Form)	To assess intervention fluency and coherence.	post-speaking	Monologue interactive role-play tasks (recorded).	+ <a href="https://docs.google.com/spreadsheets/d/1uBkDaiSOGSRWKbRKnuCJyZoQB-g_JsPJ/edit?usp=sharing&amp;oid=102361590145514708601&amp;rtpof=true&amp;sd=true">https://docs.google.com/spreadsheets/d/1uBkDaiSOGSRWKbRKnuCJyZoQB-g_JsPJ/edit?usp=sharing&amp;oid=102361590145514708601&amp;rtpof=true&amp;sd=true</a>



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Habiéndose procedido a su revisión y analizados los criterios de evaluación realizados por lectores pares expertos (externos) vinculados al área de experticia del artículo presentado, ajustándose el mismo a las normas que comprenden el proceso editorial, se da por aceptado la publicación en el **Vol. 11, No 2, febrero 2026**, de la revista Polo del Conocimiento, con ISSN 2550-682X, indexada y registrada en las siguientes bases de datos y repositorios: **Latindex Catálogo v2.0, MIAR, Google Académico, ROAD, Dialnet, ERIHPLUS.**

Y para que así conste, firmo la presente en la ciudad de Manta, a los 28 días del mes de enero del año 2026.

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