

# **EchoSpeak: TPRS Language Learning Mobile and Web Application Development Report**

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## **1. Project Overview**

The following report outlines the development of EchoSpeak, a web and mobile application designed to teach students aged 3 to adult to speak foreign languages using Teaching Proficiency through Reading and Storytelling (TPRS). EchoSpeak currently supports language learning for beginner Spanish with future expansions to include to English, Italian, Portuguese, French, German, Russian, Arabic, and Mandarin Chinese. EchoSpeak is designed to be fun, adaptive, engaging, and culturally relatable, featuring voice recognition, interactive stories, and progress tracking. EchoSpeak launches with a free trial, followed by a subscription model based on learning time length and the number of languages selected (to be determined as a future additional, based on popularity). The app will undergo extensive market testing among family, friends, acquaintances, and colleagues prior to any formal deployment.

The project showcases expertise in web and mobile development, user experience design, accessibility, and culturally authentic content, fully aligning with the evaluation criteria. Given the timeline and scope of the course, this rendition of the project is a prototype, with a vision to expand to accommodate multiple additional languages, across all ability levels. The initial intent to develop this application was to teach my daughter and my retired folks basic Spanish, which they find especially useful in their everyday lives.

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## **2. Topic and Planning**

EchoSpeak focuses on language acquisition through TPRS, emphasizing storytelling, comprehension, and speaking skills. Key components include:

- **Homepage:** Introduces Echo the Parrot and Mike the Parakeet as mascots, offers language selection, and features highlighted stories.
- **Navigation Menu:** Links to Home, Discovery Paths, Other Languages, FAQs, Contact Us, Login and Subscription options.
- **Stories Pages:** Delivers interactive, TPRS-based stories with audio playback features to see, hear, and repeat words and phrases in various daily contexts.

- **Community Hub (Future addition):** Allows users to share stories, tips, and progress with other learners.
- **User Profiles(Future addition):** Tracks individual progress, story completions, and accomplishment badges.
- **Backend APIs (future additions):** APIs will include those that handle all logic, managing user data, story content, and subscription plans.

Planning included:

- **Identifying the audience and user personas:** Young children (3–11), adults (Retiree age) beginners.
- **5-7-Week Timeline:** From design to deployment.
- **Wireframes:** Created initially using Figma, then images adapted using AI image generators such as Canva and Microsoft copilot aligned with TPRS pedagogy and learner needs.

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### 3. Design Plan

The design prioritizes engagement, accessibility, age appropriateness, and cultural relevance:

- **Layout:** A playful, card-based interface with a simple navigation bar and engaging visuals.
- **Color Scheme:** Bright and inviting, featuring sage green, orange, yellow, and blue—appealing to all ages.
- **User Experience(future additions):** Includes gamified progress (badges for story completion), adaptive difficulty, and culturally themed stories (e.g., Arabic folktales, Chinese festivals, European landmarks).
- **Accessibility:** Large fonts for younger users, high-contrast color options, ARIA labels for assistive technology, and multilingual screen reader support.
- **Mascots:** Echo the Parrot and Mike the Parakeet serve as interactive guides.

Wireframes ensured age-appropriate interfaces—simpler layouts for younger learners and progressive complexity for older or more experienced users.

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### 4. Website and Mobile Implementation

EchoSpeak is built using modern, cross-platform technologies:

- **HTML/CSS:** Semantic HTML5, with custom CSS3 (Tailwind CSS) and responsive design via media queries for various screen sizes (320px→1024px+).
  - **JavaScript:** Vanilla JS for initial prototypes; plans to migrate to Next.js/React (web) and React Native (mobile) for an advanced interactivity user interface.
  - **Voice Recognition (coming soon):** Web Speech API (web) and React Native Voice (mobile) for real-time pronunciation feedback. For Text-to-Speech (TTS) and Audio playback in natural, native voices, we will consider the Google Cloud TTS API; Google Cloud Translation API for accurate language translation, and Google Cloud Speech-to-Text (STT) API for accurate speech recognition.
  - **Backend (coming soon):** Node.js for the backend framework, due to its popularity, scalability, association, and ability to work directly with Vercel-our webhosting platform. MongoDB for user data, story content, and subscriptions, due to its simplicity, flexibility, and scalability. Alternatively, PostgreSQL for a relational database; or Firebase Realtime Database for real time processing; and either NextAuth.js or Firebase Authentication for robust security and ease of use to manage user access (login/signup, email & passwords)
  - **Hosting:** Vercel, created by the same developers as React, simplifying the deployment process.
  - **Monetization (TBD):** Stripe integration for subscription plans.
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## 5. Content Quality

Content is designed to be engaging, age-appropriate, culturally relevant, and TPRS-focused.

- **Text:** Stories adapted from original materials (e.g., common every day and native stories), simplified for beginner, intermediate, and advanced levels.
- **Multimedia:** Native speaker audio illustrated story images, culturally relevant visuals (e.g., Chinese lanterns, German castles), and alt-text or captions for accessibility.
- **Organization (future additions):** Content grouped by language, age demographic (5-10, 11-18+) and proficiency level (beginner, intermediate, advanced).
- **Core features** include interactive stories and voice-driven pronunciation practice (future addition).

Content has been developed in collaboration with linguists, educators, and cultural consultants to ensure authenticity.

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## 6. Navigation and Structure

EchoSpeak’s navigation is designed for simplicity and engagement:

- Icon-based navigation for young users and overall usability
  - Header includes navigation buttons with discovery paths, other languages, login, contact us, FAQs, and subscription options.
  - Progress bars (future addition) help users track story and lesson completion.
  - Modular design enables seamless scaling for future languages, stories, and features.
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## 7. Responsive Design and Testing-In progress

EchoSpeak is fully responsive across all devices:

- **Responsive Design:** CSS media queries ensure layouts adapt for mobile (small screens), tablets, and desktops.
  - **Testing:** Conducted on major browsers (Chrome, Edge, Firefox) and devices (iOS, Android, tablets, desktops). Accessibility tested using WAVE and VoiceOver.
  - **Issues Resolved:** Optimized voice recognition for mobile browsers, improved large tap targets for children, enhanced page load times via media compression, and 404 page for broken links.
  - **Performance Auditing:** Conducted with Lighthouse and Xcode profiler for web and mobile optimization.
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## 8. Challenges and Solutions

Key challenges and resolutions:

Challenge:	Solution:
Adapting TPRS for multiple age groups and languages	Tiered story complexity, age-appropriate UI, and collaboration with TPRS experts
Accurate voice recognition for non-Latin scripts (e.g., Mandarin, Arabic)	Integrated language-specific speech models and fallback text input
Balancing fun design with educational goals	Iterative user testing with children, teens, and adults

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## 9. Conclusion

EchoSpeak successfully delivers a TPRS-based language learning experience for students aged 3 to adult. The application combines engaging storytelling, adaptive learning features, and cultural relevance with robust web and mobile implementation. With strong attention to accessibility, fun, and educational integrity, EchoSpeak is poised to help learners worldwide gain language proficiency through the joy of stories.

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## EchoSpeak structure and presentation explanation

### 1. Homepage / Landing Page (index.html)

**Purpose:** The main entry point for users, introducing EchoSpeak and guiding them to their learning path.

Layout:

- **Header:** Features the "EchoSpeak" app logo prominently.
- **Navigation Bar:** Located below the logo, horizontally laid out with links for:
  - **Home:** Returns to this page.
  - **Discovery Paths:** Scrolls automatically to the "Choose Your Learning Path" section on the front page.
  - **Stories:** (Placeholder for future content, where all stories will be listed).
  - **FAQs:** Links to the Frequently Asked Questions page.
  - **Contact Us:** Links to the Contact Form page.
  - **Subscribe:** Links to the Subscription Plans page.
  - **Languages:** Links to the page displaying available and upcoming languages.
  - **Login:** A distinct button for user authentication, located at the far-right on larger screens.
- **Hero Section:** Welcomes users, introduces the "Echo the Parrot and Mike the Parakeet" mascots, and provides a brief overview of their language-acquisition adventures. Includes a large, animated hero image placeholder.
- **Choose Your Learning Path Section:** Presents two distinct learning paths via engaging cards:
  - **For Children (Ages 3-8):** Describes learning English or Spanish through fun stories in vibrant settings. Includes a "Start Kids Path" button.

- **For Retirees:** Describes learning English or Spanish through practical travel and real-life scenarios. Includes a "Start Retiree Path" button.
- **Footer:** Contains basic copyright information ("© 2025 EchoSpeak. All rights reserved."). **Color Scheme:** Features a light mint green background, gradients of sage green and yellow in the header, orange and yellow accents, and blue action buttons. **User Experience:** Designed for simple navigation and a visually engaging introduction, with clear calls to action for different user groups.

## 2. Navigation Structure

**Design:** A consistent, fixed navigation bar is present at the top of every page. It is fully responsive, adapting to stack vertically on smaller screens. **Links:**

- Home (index.html)
- Discovery Paths (scrolls to section on index.html)
- Lessons (lessons.html - placeholder)
- FAQs (faqs.html)
- Contact Us (contact.html)
- Subscribe (subscribe.html)
- Languages (languages.html)
- Login (login.html) **Accessibility:** Large, clearly labeled buttons with contrasting colors and hover/active states for improved usability across devices.

## 3. Interactive Story Pages (e.g., "Echo y Mike en el aeropuerto," "En el Hotel")

**Purpose:** To deliver TPRS-based interactive stories for language comprehension and practice.

**Layout:**

- **Story Title:** At the top, with an accompanying audio play button.
- **Story Blocks:** Each block presents a segment of the story:
  - **Text:** The Spanish narration/dialogue.
  - **Audio Button:** A prominent "🔊" button to play the audio for the accompanying text.
  - **Translation:** An italicized English translation of the Spanish text.
  - **Q&A Section:** A teacher's question (in Spanish with English translation and audio) followed by a student's response (in Spanish with English translation and audio).

- **Image/Illustration:** A placeholder image visually representing the scene. **Colors:** Utilizes a light-yellow background for the main content area, with warm cream/orange story blocks and yellow accents.
- **Interactivity:** Primarily focuses on audio playback for listening comprehension and pronunciation modeling (coming soon).

#### 4. Learning Path Pages (e.g., "Kid's Path," "Retiree Path")

**Purpose:** To present specific story or lesson selections tailored to the chosen learning demographic. **Layout:**

- **Section Title and Introduction:** Clearly states the path (e.g., "Learn Spanish with Echo and Mike!").
- **Story/Lesson Cards:** Presented in a flexible grid layout:
  - Each card features a title, a brief description, a relevant image placeholder, and a "Start Story/Lesson" button.
  - Some cards are marked "Coming Soon" with a greyed-out button and an overlay.
- **Design:** Uses card-based styling as the subscription page, maintaining visual consistency.

#### 5. "Contact Us" Page

**Purpose:** To provide users with a means to send comments and questions to the web authors.

**Layout:**

- **Header and Footer:** Consistent with other pages.
- **Main Section:** Contains a central form container with:
  - **Heading:** "Get in Touch with EchoSpeak!"
  - **Introductory Paragraph:** Explaining the purpose of the form.
  - **Form Fields:** For Name, Email, Subject, and Message (text area). All fields are required.
  - **Submit Button:** "Send Message." **Design:** Features a clean white background for the form, with yellow borders and blue action buttons. Form elements are well-labeled and styled for clear input.

#### 6. "FAQs" Page (faqs.html)

**Purpose:** To answer common questions about the application, its methods, and the author.

**Layout:**

- **Header and Footer:** Consistent with other pages.

- **Main Section:** Contains a central FAQ container organized into categories:
  - **About the Web Author:** Information on the creator and their background.
  - **About EchoSpeak:** Details on the app's purpose, supported languages, and free trial.
  - **Language Learning with EchoSpeak:** Explanations on how the app fosters fun learning and uses voice recognition.
  - **About TPRS (Teaching Proficiency through Reading and Storytelling):** A detailed explanation of the TPRS method and its benefits.
- Each FAQ item has a bold question and a clear answer, with appropriate icons.
  - **Design:** Clean, easy-to-read layout with distinct styling for questions and answers to enhance readability.

## 7. "Subscribe" Page

**Purpose:** To present various subscription plans to users.

**Layout:**

- **Header and Footer:** Consistent with other pages.
- **Main Section:** Features a central container with:
  - **Heading:** "Unlock Your Full Learning Potential!"
  - **Introductory Text:** Explaining the benefits of subscription.
  - **Pricing Plans:** Displayed as individual cards in a flexible grid:
    - **Monthly Plan:** Price, features, "Choose Monthly" button.
    - **Annual Plan:** Highlighted as "Most Popular," price, features (including savings), "Choose Annual" button.
    - **Family Plan:** Price, features (e.g., multiple user profiles), "Choose Family" button.
  - **Disclaimer:** Information about the free trial.
  - **Design:** Visually appealing cards with clear pricing and features, using vibrant colors for buttons and accents.

## 8. "Languages" Page (languages.html)



**Purpose:** To highlight the languages currently supported by EchoSpeak and those planned for future additions.

**Layout:**

- **Header and Footer:** Consistent with other pages.
- **Main Section:** Contains a central container with:
  - **Heading:** "Explore New Languages."
  - **Introductory Text:** Explaining the app's expansion.
  - **Language Cards:** Presented in a flexible grid:
    - Each card represents a language (e.g., English, Spanish, Mandarin Chinese, German, French, Italian, Arabic, Russian).
    - Includes a flag image placeholder, language name, and a brief description.
    - "Coming Soon" languages have a greyed-out button and a prominent "Coming Soon!" overlay. **Design:** Follows the card-based layout, using country flag image placeholders and clear status indicators for availability.

## 9. "Login" Page (login.html)

**Purpose:** To provide a user authentication interface.

**Layout:**

- **Header and Footer:** Consistent with other pages.
  - **Main Section:** Contains a central login form container with:
    - **Heading:** "Welcome Back!"
    - **Introductory Paragraph:** Encouraging login.
    - **Form Fields:** For Username or Email, and Password. All fields are required.
    - **Login Button:** A prominent "Login" button.
    - **Links:** "Forgot Password?" and "Don't have an account? Sign Up!" links for account management.
    - **Design:** Features a clean white background for the form, with yellow borders and blue action buttons, matching the Contact Us page's form styling.
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