

## *Development and Implementation of an English Pronunciation Learning Website*

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### **Abstract**

In this study, a web-based pronunciation learning system was developed. The site targets words and expressions studied in class. Students can use it in the classroom, but they can also self-practice pronunciation anywhere. The English audio was created using a free, high-quality speech synthesis site. Words and short sentences from a textbook used in class were selected, and spelling, phonetic symbols, and Japanese translations were displayed on the webpage. Buttons for audio playback were also placed on the screen. Words and phrases are arranged in the order they appear in the textbook. A search function is added to enable pinpoint search. Students were surveyed at the end of the Fall 2023 and Spring 2024 semesters. The results were highly encouraging, with many positive comments and valuable feedback in the free-response section.

Keywords: Pronunciation Learning, Web-Based Learning Materials, Classroom Use, Self-Study

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## **Introduction**

Traditionally, in Japan, emphasis has been placed on acquiring knowledge through reading and expressing thoughts through writing, which left the learning of speaking and listening behind<sup>1</sup>. Until recently, university entrance exams focused on grammar and vocabulary, with few questions testing oral communication skills, and consequently, high school education prioritizes writing ability over pronunciation. The phonetic differences between Japanese and English also create difficulties, as some sounds in English don't exist in Japanese. This factor makes learning English pronunciation even more difficult in Japan. Since Japan is a relatively homogeneous society with limited opportunities for real-life English interaction, students rarely can listen to and practice speaking English outside the classroom. Also, non-native English teachers without strong pronunciation skills make it difficult for students to learn accurate pronunciation. For these reasons, and from the cultural background that Japanese people are not very active in speaking up, Japanese students tend to avoid speaking English aloud when they don't have confidence in pronunciation. This hesitation hinders their pronunciation development.

So, how can students learn English pronunciation? In the days when speech reproduction was not yet technically easy, pronunciation learning was done by referring to phonetic symbols in dictionaries. However, in recent years, a significant number of students have not been taught and understand how to read phonetic symbols before entering university. Now, with the advancement of technology, students can easily reproduce sounds as many times as they wish. Therefore, the most effective way to improve pronunciation is to integrate more listening and speaking exercises using native speech in and outside classrooms so that students can cultivate confidence in English communication.

One practical approach to improving listening and speaking skills is mimicry, which involves imitating a speaker's pronunciation, including sounds, rhythm, intonation, and other aspects of the speech. Native speakers are the best source of authentic pronunciation, intonation, and rhythm, but it is not always accessible when you reside in non-native environments. In such cases, thanks to technology again, synthesized speech is a strong partner. Modern speech synthesis technology can produce high-performance synthesized speech equivalent to human speech, and some are free of charge. Students can then choose the voice they wish to imitate. There are several options for voice quality as well as gender. They can also select the country or region where English is spoken, as English is pronounced differently with regional pronunciation and accents.

In this study, a web-based pronunciation learning application was developed. It utilizes speech playback, where speech was generated using speech synthesis. Students can use it on a PC, smartphone, and tablet in and outside classrooms, allowing them to learn pronunciation efficiently, irrespective of location and time.

### **1. Development Environment**

This application was developed on Xserver with the cooperation of a software developer. Xserver is a popular web hosting service based in Japan, known for its high-speed performance and reliability. With this application, students can learn pronunciation repeatedly by playing sample audio files on the site. Using WordPress, teachers can create and register content such as spelling, phonetic symbols, Japanese translations, and audio. WordPress is a content management system that allows teachers to create, manage, and

publish websites without advanced coding skills. The audio files are in mp3 format, generated by the high-quality speech synthesis site "Ondoku-san"<sup>2</sup>. We selected American male and female voices.

## 2. Material Contents

This application has two categories: one for classroom texts and the other for leisure content. For efficient learning, a longest-match search function has been added.

### *Content for Classes*

A website for each class is password-protected. Vocabularies are displayed in order of appearance in the text, along with spelling, phonetic symbols, and Japanese translations. There is also a button to play the corresponding audio files. A search function allows users to search for words, translations, unit numbers, and keywords with the longest match. Each webpage usage is limited to students registered for that class.



Figure 1: Class Login Page, Which Requires Passwords



Figure 2: Top Page (Left), Example Class Page (Right)

### *Fun Websites for Students to Learn English Pronunciation*

Websites for learning English for fun were created. Students can enjoy a site with minimal pairs of English vowels with illustrations and a site with tongue twisters to practice English consonants, which Japanese people are not good at.

The screenshot displays two sections of the website. The left section, titled '母音-005. cat, cut', features illustrations of a cat and a pair of scissors, with a play button and a progress indicator (0:00 / 0:05). Below it is '母音-006. cap, cup' with illustrations of a cap and a trophy, also with a play button and progress indicator (0:00 / 0:05). The right section, titled '早口-004. She sells seashells by the seashore.', contains a list of sentences with corresponding Japanese translations in orange boxes: 'She sells seashells by the seashore. 彼女は海辺で貝殻を売っている。', 'The shells she sells are surely seashells. 彼女が売る貝殻は確かに貝殻だ。', 'So if she sells shells on the seashore, だから彼女が海辺で貝殻を売っているなら', and 'I'm sure she sells seashore shells. 彼女が海辺で貝殻を売っているのは間違いない。'. A '全体を再生' (Play all) button and a progress indicator (0:00 / 0:12) are also visible.

Figure 3: Vowel Minimal Pairs (Left), Tongue Twisters (Right)

### English Lyrics Site

Students can also enjoy a website for English lyrics, focusing on songs familiar to students and music used in movies. The song list is in alphabetical order, and when you click the song title, the screen transitions to the lyric page, where you can generate speech phrase by phrase. By mimicking the words, users can acquire the pronunciation. At the bottom of each page is a reference link to YouTube and some information about the song.

The screenshot shows the 'Winter Wonderland' page on the website. The title 'Winter Wonderland' is prominently displayed, along with the composer 'Felix Bernhardt' and the year 'Written in 1934'. Below the title, there are three phrases with play buttons and Japanese translations: 'Sleigh bells ring, are you listening? (Doo) ソリの鈴が鳴る 聞こえるかい?', 'In the lane, snow is glistening 道は雪できらめいている', and 'A beautiful sight, we're happy tonight'. On the right side, there is a '参考動画' (Reference Video) section featuring a YouTube video thumbnail for 'Michael Bublé - Winter Wonderland [Official HD]' and a link to 'ウィンターワンダーランド 歌詞の意味・和訳'. Below that is a section titled 'この曲の背景' (Background of this song).

Figure 4: Lyric Site English Songs

### Evaluation

#### Evaluation for Contents for Classes (Fall 2023)

80 students used this pronunciation site during the fall semester of 2023 and completed a questionnaire at the end of the semester. As a result, 45 of 80 students (56%) answered "easy to use," and 31 (39%) answered "fair". When asked if they could learn pronunciation, 73 out of 80 (91%) responded "definitely yes" or "yes". Students gave positive comments and valuable feedback in the free response column, suggesting the effectiveness of this site.

### Evaluation for Contents for Classes (Spring 2024)

76 male and 21 female students answered the questionnaire. To the question, "Are you using this application?" 14 (14%) students responded "frequently," and 59 (61%) responded "sometimes." As for the device, 62 (64%) students were using this application with PC. 13 (13%) students answered the application is "great fun," and 35 (36%) students chose "Fun." 30 (31%) students answered "Very much so" to the question, "Do you think it will improve your pronunciation?" and 53 (55%) students replied, "Yes to that question.

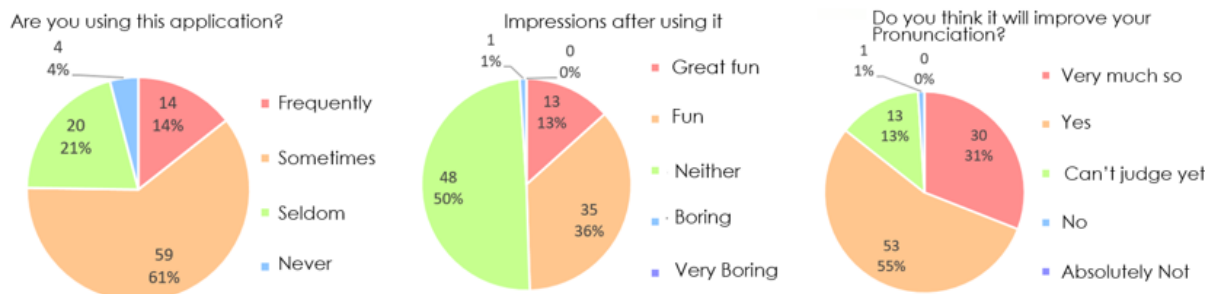


Figure 5: Class Evaluation (Spring 2024)

### Evaluation for Spring 2024 Lyric Site Evaluation

I asked 10 people (three male and seven female) taking singing lessons to use the site and answer the questionnaire. Eight people used smartphones. Four people answered that using the site is "great fun," and five replied, "fun." Eight people answered "very much so" to the question, "Do you think it will improve your pronunciation?" In addition, I asked them to select features they liked, allowing multiple answers. The results are shown in Figure 7.

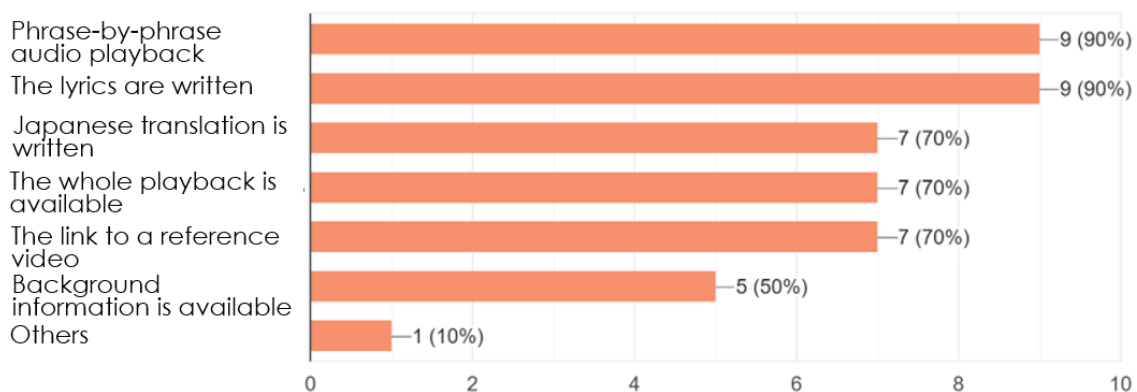


Figure 6: Preferred Characteristics

### Conclusion

In this study, a web-based pronunciation learning application was developed. It utilizes speech playback, where speech is generated using speech synthesis. Students can use it on a PC, smartphone, and tablet in and outside classrooms, allowing them to learn pronunciation efficiently, irrespective of location and time. The site was used in class to introduce new vocabulary in each unit and was found helpful for students to understand the meaning and pronunciation of the words. The site also helps students with self-study for preparation and reviewing, especially in engineering English, where many words are tricky to pronounce. Lyric sites also received high results in the evaluation.

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