

Development of a Smartphone Application for the Study of English Pronunciation and Related Data Gathering

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Abstract: This poster presentation outlines the process of developing a smartphone application used as a resource for 1) the study of English pronunciation, and as 2) a data gathering tool for quantitative analysis of its users' study habits. The presentation focuses on the rationale for the application, the factors considered in its design as well as the stages of development required for bringing the project to fruition. The presentation concludes by looking at how the application can be scaled to include other learning communities outside of the Japanese English as a foreign language (EFL) context.

Background

Pronunciation is a fundamental aspect of successful linguistic communication, yet it is often ignored in Japanese EFL classrooms (Nunan, 2003; Kikuchi & Browne, 2009; Uchida & Sugimoto 2017). Reasons for this are largely socio-cultural, with some believing that the unrealistic adherence to the native English speaker model is demoralizing for Japanese English teachers who may have difficulty producing these accents, and therefore leads to the avoidance of its' instruction (Jordan, 2011). As a result, many Japanese learners of English have little experience with the oral movements needed to pronounce English words fluently by the time they reach university, making this type of instruction precisely what they need (O'Connor, 1998).

At Kyushu Sangyo University (KSU) in southern Japan, students are required to study 1600 of the most frequent words in the English language as part of its' core curriculum. These words are studied over the course of two years, or four semesters of mandatory English education. Each semester's worth of words is then subdivided into 10 sets of 40 words each that are assigned to be studied as weekly homework in preparation for subsequent in-class tests. Students are provided with a university-published dictionary that contains definitions, translations, as well as example sentences using these words. This is the only resource they are provided with for their vocabulary study, and unfortunately it does not contain instruction on how to pronounce these words.

Rationale

Although there are many resources online that generate audio files which allow learners to hear the pronunciation of a word, rarely do these recordings offer any insight into the actual oral movements needed to produce such pronunciations. Nor do they offer any first language translations of the meanings of these words in accompaniment of oral representations. This demand for a more comprehensive tool for the study of English pronunciation at KSU is what the application in question was initially designed to address. However, during development it was realized that the application could also be used for data capture on the backend. Providing researchers with a valuable resource for quantitative investigation into the study habits of learners using the tool.

Therefore, the application in its current form serves the dual purposes of: 1) allowing its' users to view short audiovisual clips that present the sound and images of English words being pronounced by a native English speaker with subtitled Japanese translations of those words underneath; and for researchers, 2) it serves as a data gathering

tool for information pertaining to duration and GPS-based location of use, time stamping and word choice, which are compiled in an online repository ready for quantitative analysis.

Stages of Development

Conception

In spring of 2016 one of the teachers at KSU tried to address the lack of support for pronunciation instruction by uploading videos of himself pronouncing words from the prescribed wordlists to YouTube. Each video consisted of a week's worth of words (40 words), slightly spaced so that viewers could repeat each word if needed. The clips used amusing video filters to make them more engaging for students. They were presented as a self-study tool to help students prepare for their weekly listening vocabulary tests.

Unfortunately, students seldom used the videos. Reasons for this include issues with Internet connectivity and having to create/use personal YouTube accounts to search for and view the videos. Viewing individual words was a problem as well. If a student wanted to hear a particular word, they would have to scroll through 40 other words to find it. Moreover, the clips were not accompanied by subtitles, making it harder to locate the specific words they wished to practice amongst a video of 40 words being pronounced. Also, due to the lack of subtitles, students had to rely on their own notes to associate the meaning of each word with its auditory representation, thereby increasing their cognitive load during study. In short, the videos proved unsuccessful as a resource for studying the pronunciation of required vocabulary.

A New Approach

In 2018, the same teacher began working with the programming languages *Unity* and *C#* in order to develop a smartphone application for a separate project. It was at this point that he realized that his original pronunciation video idea could also benefit by developing the tool as an application, rather than having to deal with the restrictions of using an external platform such as YouTube. Soon afterwards in spring of 2019, a beta version of the application was created and used in classes to gauge the efficacy of further development. *Figure 1a ~ e* show screenshots from this version of the application.

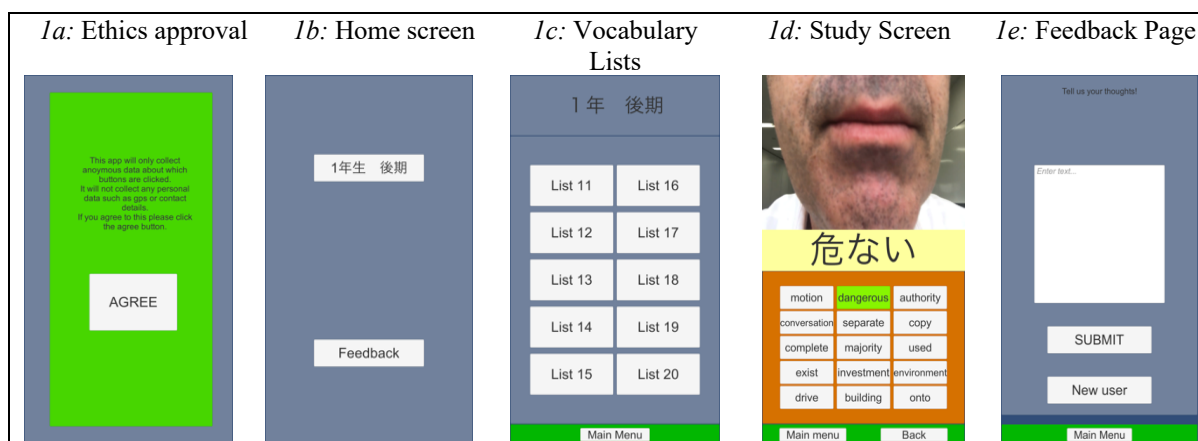


Figure 1: Screenshots of Current Application (Beta Version)

Funding the Application

Pleased with the feedback received from early users, a fellow colleague was then enlisted to help procure funding needed to develop a more polished version of the application. In September of 2019, applications were then

submitted for both an internal grant from KSU as well as a national grant from Japan’s ministry of education to help make this happen. We are pleased to report that grant approval has since been obtained, and the development and production schedule of the application has been decided. *Figure 2* depicts the current plan of action and times allotted for each stage of development moving forward.

Procurement of financial aid allows for the hiring of “speech actors” and a production crew needed for the recording of audiovisual content. It also supplements the costs of attending conferences where the researchers hope to consult with like-minded professionals in order to receive feedback on the project. Once the audiovisual content for the application has been captured and properly edited, it is hoped that a minimum viable product (MVP) will be up and running by September of 2020; the beginning of the second semester of study at KSU.

RESEARCH OBJECTIVE	YEAR											
	2020										2021	
	A	M	J	J	A	S	O	N	D	J	F	M
1) Application Development												
- hire "actors" & production crew	■	■										
- capture/edit audiovisual data		■	■	■								
- program application	■	■	■	■	■	■	■	■	■	■	■	■
2) Data Capture												
- decide intervention schedule				■	■	■						
- capture data						■	■	■	■			
- analyze data										■	■	■
3) Academic responsibilities												
- Present on findings to date			■	■	■	■	■	■	■			
- Publish findings to date										■	■	■

Figure 2: Research Schedule

Future Iterations

The primary purpose of the application is to provide students with an audiovisual resource for the study of English vocabulary pronunciation. Therefore, its design will forgo colorful graphics and interactive learning game mechanics in favor of a simple interface and utilitarian approach towards navigating content. The reason for this is to keep the overall size of the application small, as students will be needing to download it onto their smartphones for use. Limiting the scope in this manner will also help make development more cost effective and less time-consuming.

When users first open the app, they will be greeted with an End User License Agreement (EULA), which will inform them that their data will be anonymously collected and sent to an online repository for the purposes of future research. Upon agreement, users will then be ushered to a “home” screen where they can choose from a list of native speakers to use as their demonstrator of pronunciation (previously referred to as “speech actors”). Users will then be able to choose a word list from their course’s core vocabulary, which then opens into a screen that allows them to choose an individual word from that list. At which point they can hear and see their chosen actor say that word. They will also be able to see the Japanese translation of that word. Each time a word button is touched, the application will send information such as the selected word, time of day, the actor, and the user’s nickname, to an online repository. This will allow researchers to collate and analyze students’ study habits while using the app. The application will be made available on both the iPhone app store and the Google Play store, making it accessible to

students both inside and outside of KSU. Many students in other schools study this vocabulary, therefore it is hoped that this resource will also be used by them.

Academic and Broader Implications

Once the application is up and running, the project will shift focus from development towards analyzing the data gathered by the application. These findings will be presented in future publications once ready, and will attempt to answer the following questions: 1) To what degree do Japanese learners of English benefit from studying English pronunciation via the proposed application? 2) What are the patterns of use for those studying with the application in terms of: the words being studied, consistencies between these words, reasons for word choice, and the frequency of words being chosen? Finally 3) based on the data, what can we predict about the ways in which Japanese students choose to study English pronunciation? Insights into these questions will inform future iterations of the application which are hoped to cover more languages than English alone. In this regard, it is believed that this project has great potential benefits for not only the students at KSU, but for all language learners that wish to improve their pronunciation of the languages they study.

References

- Nunan, D. (2003). The Impact of English as a Global Language on Educational Policies and Practices in the Asia-Pacific Region. *TESOL Quarterly*, 37 (4), 589-613.
- Kikuchi, K. and Browne, C. (2009). English Educational Policy for High Schools in Japan: Ideal vs. Reality. *Regional Language Centre Journal*. 40 (2), 172-191.
- Uchida, Y. and Sugimoto, J. (2017). A Survey of Pronunciation Instruction by Japanese Teachers of English: Phonetic Knowledge and Teaching Practice. *Journal of the Tokyo University of Marine Science and Technology*, 14, 65-75.
- Jordan, E. (2011). Japanese English Pronunciation – Issues of Intelligibility, Achievability and Perception in the Context of World Englishes. *Journal of English as an International Language*, 6 (1), 81-91.
- O'Connor, J.D. (1998). Better English Pronunciation. *Cambridge University Press*.

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