Practikana: Language Learning Application

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Abstract:

We present Practikana, a web-based solution that allows eager individuals to easily study another language. Practikana mimics the way students study with flashcards and self-quizzing by using rapid and fun interactive games. Vocabulary words will pop up on the screen and the users will have to translate them to achieve points to win. Users have the option to play against one another during the game to help each other learn. The social competitive environment will increase the rate at which users will effectively retain knowledge of the language. Our features are based off the several different research methods we used to prepare for this project, they are systematic review, system analysis, user interview and peer reviews. This article will explain the research behind Practikana starting with our motivation behind the need for a better language learning application. It will explore how we viewed existing solutions that people use today to ease the process of language learning and what success those applications have and how they fail. The paper addresses the findings we found from the related work and how we molded it into our own improved solution, Practikana. It discusses Practikana's design and layout of the application. Last, but not least, how we interpreted our findings with respect to our research question and what new knowledge we gained from this study.

Introduction:

As many first world countries are becoming more and more diverse, the ability to speak a second or even third language is becoming more of a necessity. Americans today suffer from inadequate foreign language education. About 15-20 percent of Americans consider themselves bilingual, compared to 56 percent of Europeans. The inability to speak a foreign language makes it difficult for Americans to compete globally on a linguistic and cultural level. Language is a pathway to a country's history, culture, and people. So it is not only important to be able to speak another language but to understand other diverse backgrounds and people. With today's global movement towards diversity, it is more important than ever to learn and speak another language and achieve a global perspective.

Our goal is to ease the process of language learning. Depending on the language you're learning, there will be many varying numbers of intricacies you must learn. For example in Japanese, you must learn it's three alphabet system, different forms of formality usage, varying counting method of objects and much more. In Spanish, there is a lot of irregular verb and adjective conjugations that don't match a similar pattern. Learning all of this at first can be very daunting and discouraging for the learner. So we seek to create an online web app that can easily let language learners practice these language intricacies. This project app will be directed towards eager individuals who are studying another language. It will help supplement and support what they learn in the classroom/world and provide another practicing method. In using this app they can learn the proper grammar, vocabulary, conjugation and typing in a new language. About 93% of high schools offer a second language course, 290,000 American students received credit for studying abroad in 2013, and there about 886,000 undergraduate and graduate students enrolled in American universities between 2013 to 2014. So if we are able to create a versatile web app that can appeal to these language learners, then we can reach and help many people worldwide study and practice to become polyglots.

The language web app will act similar to the way students study with flashcards. A word or character will pop up and the user will type in the correct meaning or conjunction. The user will also have the ability to pick and choose what they want to learn and can also incorporate their own vocabulary and meaning. Our web app will seek to be simplistic and easy to use. We will use Django's web framework because it's one of the fastest web frameworks to get running. Data will be stored on MySQL Lite, and hosted on Heroku which offers free unlimited hosting. We decided to make it a web app because with certain languages, it takes a lot more keystrokes to type certain words. So a phone app will be harder for the user. There was also a research that found that smartphones are more used for leisurely, and fun rather than studying and laptops are more associated with learning. Also by making it a web app, the user can learn and practice how to type in the language they're studying.

The common language learning applications aren't social and ours seeks to change that through social quizzes and competitive games. There are existing solutions where individuals can play games, but ours will bring a different style to the table. The games will be fast paced where users have to type in the correct answer as fast possible. This can increase user's cognitive reading and understanding abilities and how fast they can process it. Practice makes perfect, and so we strive to create an easy to use web app that users can use daily and learn through repetition but also provide enough content to be able to extend a user's knowledge.

Related Work:

User Friendly Interface

The following papers/applications Duolingo, Read the Kanji, all expressed the necessity of a user-friendly interface.

What does that really mean? It means an interface is visually appealing, doesn't provide many options, and guides the user to their desired goal, which is to start learning a language. Applications need to have meaningful icons that are consistent design patterns so they are easily recognizable and don't require much thought. Positioning buttons and labels in meaningful areas that will provide maximum information for the users. Labels and symbols should not ever cause confusion for beginners. For expert users of the system, there can be an option to expand the system features that would otherwise be hidden from novice users. Our solution seeks to blend all these features into one rather than the existing solutions that miss one of two features in the blending process or aren't implemented well.

Wait-learning

The following papers/applications Wait-Learning: Leveraging Conversational Dead Time for Second Language Education, Micro Mandarin believes that wait learning is the key to a successful design. Micro-waiting and micro-learning are the processes of taking a few seconds that a user would normally be waiting to learn something new. People tend to have busy lives, which makes it difficult to master a second language. Wait learning is the solution to this problem. If a user is able to start a "lesson" or learn a new word in a matter of 3 clicks without any tutorial or guide there is no limit to what you can learn.

Content

Another part of what makes a system successful is that it can boast enough content for users to continually learn. A lot of applications today achieve this, such as Duolingo, Mirai Japanese, Read the Kanji and also WaniKani. Duolingo boasts a variety of languages, Read the Kanji and WaniKani contain large dictionaries of Kanji and their meanings. These apps are also broken up into different lesson plans and chapters based on difficulty. This lets users learn at whatever level they are currently at and choose what they want to study. Base on the level of content we found in these systems, we want to provide the same level of depth. We will follow a Japanese book called Genki, and try to implement all the content in the book. Genki is broken down into organized sections so it will be easy to follow and implement. There were no applications that we found followed a specific book. So our web app will help support students also using the book and provide another level of practice and supplement their learning.

Research Methods / Findings

There were four main research methods that were conducted. Systematic reviews, system analysis, user interviews, and peer reviews.

We conducted systematic reviews by searching through relevant online databases, such as ACM's digital library and IEEE's digital archives articles, for prior language learning research. Through iterative and participatory research we concluded that wait learning, games, voice recognition, and web applications are areas to focus on. Wait learning is the process of taking a few seconds that a user would normally be waiting to learn something in that amount of time. People tend to have busy lives and creating an application that can cater to this design will result in more people mastering a language. Games were found to increase the likelihood of users coming back to play, which results in the user having fun while learning the language. An interesting article was written about (talk about the web vs mobile)

Brainstorming and reviewing existing language learning applications helped us make a system analysis report. The most successful applications included features, such as wait-learning capabilities, visuals, versatility, no cost, saving user progress, easy installation, large content, social interaction, and a simple quick interface to start learning/studying. Along with the features of the system, the system as a whole had to be “bug-free” in a sense of running smoothly and quickly.

User interviews were done with current college students that are currently in a beginning foreign language class. These students were chosen because they are learning a new language and our application seeks to ease the difficulty of that process. Questions included, “What is the hardest part about studying the language?” and “ What do you think is the most effective form of studying?”. The common findings from the interviews were that students use flashcards, friends to study, and often don’t use technology to help them study. Based on our findings we asked ourselves “How can we make technology with the same features our interviewees desired when not using technology?” Since our prototype already contained flashcards and a social setting from our research. We concluded that our prototype was going in the right direction and at the very least be applicable in low-level language learning.

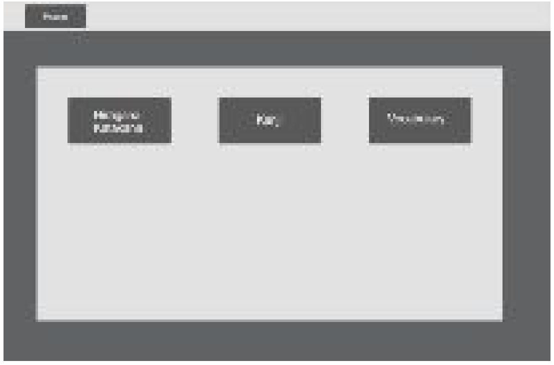
With peer reviews, our group gave a presentation in front of our ICT class explaining our prototype and how it was built off the research we’ve done. Our cohorts responded with questions, reviews, and ideas for improving upon our ICT project. Our peers felt as if we were lacking a couple of features, such as a way to hear the word being said out loud. The questions we gained from this were, how are we going to support multiple languages and custom flash cards. We’ve appreciated all the feedback but we are focused on getting our critical features up and running. In the future releases of Practikana, we hope to include most, if not all, of the suggested features above.

Prototype:

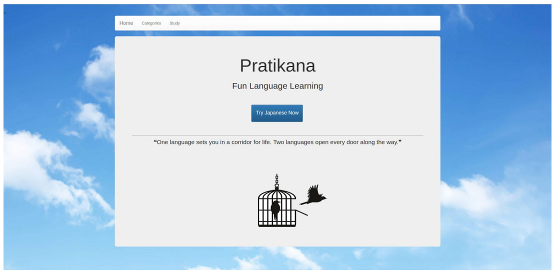
Home Page

Pratickana’s homepage will have different aspects of learning a language. Practickana will first support native English speakers that are learning Japanese. So, it will have three aspects of learning Japanese, which are the two initial syllabaries, kanji meaning, and vocabulary. Users will be able to select from the homepage which category they want to study for. Once selected they will be sent to a selection page.

Initial Prototype



Final Prototype

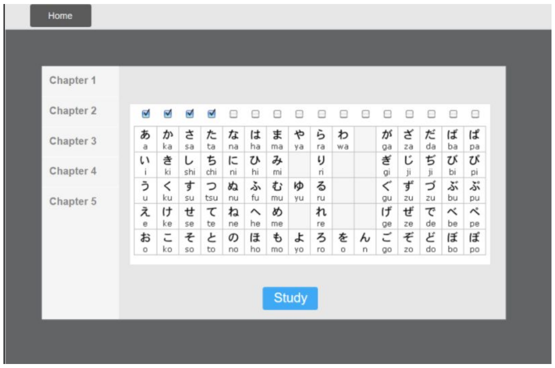


"One language sets you in a corridor for life. Two languages open every door along the way."

Selection Page

This page will be where users can select chapters they want to study from. With each chapter comes higher levels of difficulty. The chapters, words, or kanji that they select will be the ones they study or play with. After selecting what they want to study, there will be a "Study/Play" button that will lead the user to the study page.

Initial Prototype



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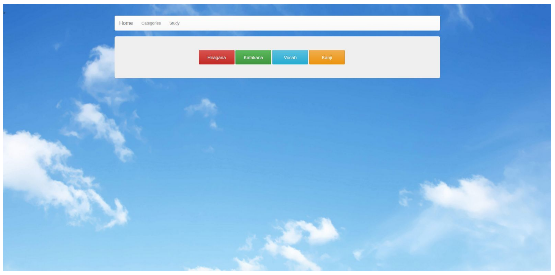
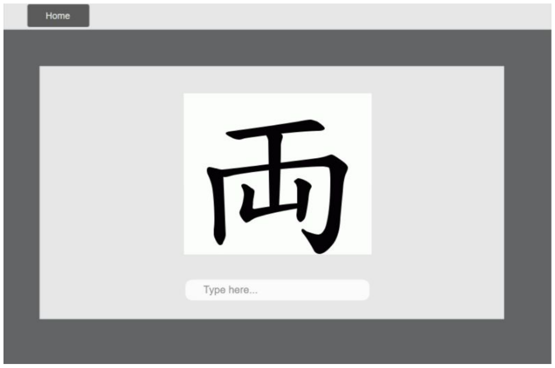


Study/Play Page

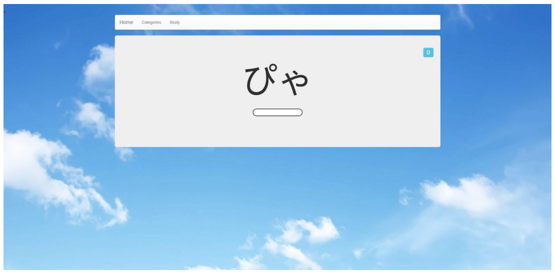
This page will be where the user practices the content they selected. There will be two sides, a study side, and a play side. The study side will have the user type the appropriate translation or meaning of what appears on the screen. After the user types what they think is the correct answer, the site will validate if it was correct or not and give points out accordingly. This will continue until the user's desired score is achieved. Words or kanji that the user gets correct will appear less often compared to the wrong answers. On the play side, user's will have some games that they can play. We plan to create two interactive games. One game will be a type racing game, where the user has to type the correct answer as a fast as possible, which will move a car on top of the screen. The faster they type the faster the car will reach the finish line. The second game will feature words falling on top of the screen and users will have to type the correct meaning to those words to destroy it. The goal will be to keep the words from reaching the bottom of the screen.

Our initial design only had the study side with flashcards appearing on the screen and the user typing the correct answer. But after doing research into how people learn, we found that social, competitive, and fun methods of learning were very effective. So, we decided that we could easily implement games that incorporate fun and competitiveness. We also found that learning apps that have different levels of difficulty, that are separated into sections, made it easier for users to learn. We decided to separate our learning categories into chapters following a textbook and making each chapter harder than the last.

Initial Prototype



Final Prototype



Technologies

We used Django as our main web framework because it was one of the fastest frameworks to get a site up and running. It also has many built in features that we could easily used. Django comes pre-built with MySQL Lite, so we used that as our main database where we stored our translations of words and alphabet. We built our pages in HTML/CSS and Django renders those pages for us. Context language was used to transfer data and features from Django to HTML. We used Twitter BootStrap to extend our CSS capabilities to achieve our front end by using template styles. JQuery was also used to implement our “study” page to make it fast and interactive, and also string matching. Json Pickle was also used to turn Python data structures into usable JavaScript variables.

Differences

Achieving our front end took more time than expected, so we were not able to implement the play section of our initial prototype. One of our goals was to create fun games to make learning easier, but we ran out of time.

Discussion and Implications:

The findings we found with our project is that there isn’t a true dominant application today for language learning. Many people use different ones for different features that they liked over a different products. The market for this problem is still in high demand and many users are waiting for a new improved solution.

During our poster session we got good feedback from Western Washington University professors including Geoffrey Matthews who gave us insightful tips about how we should continue the development of your project. He said that we should only focus on words that are most commonly used and not worry about certain ones that are rarely used, such as, giraffe.

Why could this information that was shared to us be useful? This could be the turning point research that we to make our language learning application the best. We could gather data on what the most common words were used during a certain year or possibly what words are common among people of the age group between 15-20 etc. All this information can also be useful for language analytics experts, who interpret large volumes of unstructured natural language conversations into meaningful data.

Conclusion:

It takes a lot effort to study another language. You have to study vocabulary, grammar, speech, reading and other nuances that might not exist in your native language. We wanted to create an application that can ease this learning process. After doing some research we found that applications are successful when they are simple and easy to use. We also found from conducting interviews of students, who were taking language courses, that they don't often use any technologies that help them study. Instead they use the old fashioned flash card type method of studying. So, we set out our prototype to mimic this way of studying by having all the flashcards be online and stored in a database. Our goal was so users could quickly use interactive with our web application to quickly start studying/learning. Two of our goals were achieved through the study page and our easy to use interface, but games were not able to be implemented due to the unpredictable time it took to implement the front end.

Some of the challenges that we faced was that two of our team members did not have too much knowledge on front end development. Implementation of the front end took twice as long as we had to learn as were developing. Another challenge we faced was sending data from Django to HTML. Our data structures were in Python but to use it we had to change to JavaScript variables. We solved this problem by using Json Pickle and Django's Context language to parse and change Python data structures to match with JavaScript variables. Time was also a constraint since we only had 4 weeks to do both the backend and frontend. Because of time we were unable to implement fun and interactive games for the students to use.

There is a lot that needs to be done for language learning. There are a wide variety of applications out there and they all achieve different things. What makes our application unique is that we will have games that can help learning more fun. But unfortunately we were unable to implement them, so our work could be extended into different types of games that students can play. Sociability is also an important aspect of learning so creating a connective tool that can connect people and let them study together can achieve the goal of proficient language learning. There are as many ways to learn a language as there are languages in the world, but Practikana has potential to be one of those learning methods. So a continuing development and extension of our application can help achieve language proficiency.

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