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ZUCA Words

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ABSTRACT
A small educational website geared towards helping Kindergarten students practice their sight words through a few fun online games.
Lancelot Jeff-Macauley Jr.

ZUCA WORDS
A Fun Way To Practice Sight Words!
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1 Executive Summary

1.1 Background

Mastery Charter Schools and Mastery Schools of Camden are a non-profit school network of 22 schools in Philadelphia, PA and Camden, NJ. One of the subjects that Mastery Charter Schools focuses on is reading:

“For each report period, students in kindergarten through sixth grade are evaluated on skill mastery in reading, writing, math, science or social studies, and specials” (pg. 9).

Specifically using the F&P curriculum to judge students reading levels:

“Kindergarten through second grade report cards also include each student’s Fountas and Pinnell (F&P) reading level, number of sight words known, and math benchmark score.” (pg. 9).

This F&P curriculum stresses the importance of sight words in order to successfully master the different reading levels. Sight words are high-frequency words that are used in children’s books. Many of the sight words are tricky because they cannot be sounded out, the only way to learn these words is through practice and memorization.

For example, lists 1 through 7 (words to know before entering First grade) are as follows:

<table>
<thead>
<tr>
<th>List</th>
<th>Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>List 1 (Red)</td>
<td>I, like, to, is, we, me, can, the, see, a</td>
</tr>
<tr>
<td>List 2 (Orange)</td>
<td>you, and, am, look, on, go, my, he, at, in</td>
</tr>
<tr>
<td>List 3 (Yellow)</td>
<td>no, it, do, up, an, little, big, with, so, this, was, run, play, are, jump</td>
</tr>
<tr>
<td>List 4 (Green)</td>
<td>said, get, put, some, come, as, be, all, she, has, for, or, him, his, her</td>
</tr>
<tr>
<td>List 5 (Blue)</td>
<td>went, out, our, what, not, now, how, by, if, that, ball, of, us, then, did</td>
</tr>
<tr>
<td>List 6 (Purple)</td>
<td>got, sit, boy, girl, ran, read, have, new, yes, want, who, they, old, down, from, them, love, one, when, why</td>
</tr>
<tr>
<td>List 7 (Pink)</td>
<td>day, first, next, last, sat, will, had, man, off, their, where, eat, but, two, too, just, school, your, there, into</td>
</tr>
</tbody>
</table>

1.2 Problem

Ms. Zucatti is a kindergarten teacher at Mastery Charter Schools of Camden and during the school day there is limited time for her student’s to specifically practice their sight words. They have reading rotations daily where they are split into groups and cycle through reading stations which are each 30 minutes long. The past two years Ms. Zucatti’s class had 4 stations, 3 of which were led by either her or the two helper teachers in the classroom. The fourth station was not teacher led but gave the students a chance to play online games that helped with reading. Teachers were encouraged to use a designated website for this rotation although they were and are permitted to use any website they feel is beneficial to the students’ learning. Ms. Zucatti realized that her kids were using this designated website to play games that were not very beneficial in helping to practice reading. Either they were playing games that focused on dressing characters or going through sight words that did not specifically relate to Master Charter
Schools’ sight words list, and saw that this reading station was not promoting reading growth as well as the other three stations. She has since discontinued that station but would be willing to bring it back if she could get a more personalized website specifically for her school and class level.

1.3 Proposal

The proposed project is to create a fun and relatable educational website with a few games to help Ms. Zucatti’s students at Mastery Charter School of Camden practice their sight words during reading rotations. The website will provide an interactive educational environment focusing on teaching children how to both recognize sight words and pronounce them correctly. It will primarily consist of different games that will challenge the student to recognize and pronounce the sight words correctly. The website will be equipped with text-to-speech (TTS) to read words to the students as well as Speech Recognition to analyze the speech received from the students. Both teachers and students will be able to login. Students will login to play and teachers will log in to setup class accounts and monitor their students’ progress. Students will also be able to monitor their own progress. A database will be used to keep track of success. When a level is completed, the respective record in the database will be set to complete, thus the next level will be the only available level. Saving will occur automatically after each game is completed and so the teachers will not need to save the students’ scores. The sight words list will be based on the Mastery Charter Schools’ sight words list which are based among the most popular lists that are taught in numerous classrooms across the US. This website can be used both during the school day during their reading rotations and also at home.

2 Requirements

Browser: Google Chrome Version 50+
Audio: Headphones or Speakers

3 User Stories
### 3.1 Teacher

<table>
<thead>
<tr>
<th>As a…</th>
<th>I want to…</th>
<th>so that…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher</td>
<td>Create an account</td>
<td>I can login</td>
</tr>
<tr>
<td>Teacher</td>
<td>Edit my account</td>
<td>I can change my info, pwd, etc.</td>
</tr>
<tr>
<td>Teacher</td>
<td>Sign in</td>
<td>I can use the website</td>
</tr>
<tr>
<td>Teacher</td>
<td>Logout</td>
<td>I can end my session</td>
</tr>
<tr>
<td>Teacher</td>
<td>Add a class</td>
<td>Students have accounts to login</td>
</tr>
<tr>
<td>Teacher</td>
<td>Add a student</td>
<td>New students can be added to an already existing class</td>
</tr>
<tr>
<td>Teacher</td>
<td>View student info</td>
<td>I know which username goes to which student</td>
</tr>
<tr>
<td>Teacher</td>
<td>View class password</td>
<td>I know the password for each class</td>
</tr>
<tr>
<td>Teacher</td>
<td>View students’ progress (level, stars, pellets)</td>
<td>Determine if they are making sufficient progress</td>
</tr>
</tbody>
</table>

### 3.2 Student

<table>
<thead>
<tr>
<th>As a…</th>
<th>I want to…</th>
<th>so that…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td>Sign in</td>
<td>I can use the website</td>
</tr>
<tr>
<td>Student</td>
<td>Start a game (concentration, womp womp or test)</td>
<td>I can play the game</td>
</tr>
<tr>
<td>Student</td>
<td>Play concentration</td>
<td>I can collect pellets and increase my level</td>
</tr>
<tr>
<td>Student</td>
<td>Play womp womp</td>
<td>I can collect pellets and increase my level</td>
</tr>
<tr>
<td>Student</td>
<td>Take the test</td>
<td>I can collect stars and increase my level</td>
</tr>
<tr>
<td>Student</td>
<td>Be able to speak into the microphone and have my words recognized by the game</td>
<td>The game can tell me if I said the word correctly or not</td>
</tr>
<tr>
<td>Student</td>
<td>Be able to hear words from the website</td>
<td>I can understand how to play</td>
</tr>
<tr>
<td>Student</td>
<td>Save my story progress</td>
<td>I don’t have to start the story from the beginning every time</td>
</tr>
<tr>
<td>Student</td>
<td>View their story progress (level, stars, pellets)</td>
<td>See what progress they’re making</td>
</tr>
</tbody>
</table>

### 4 Challenges Faced

At the start of this project the goal was to also include Speech Recognition in addition to TTS to be able to capture and analyze the student’s speech. I wanted to add in a second game called “Womp womp” which would have been the second pellet before each star. I also wanted to make the site broader to not only address the problem Ms. Zucatti was having at Mastery Charter School but to provide this website to all elementary school teachers looking for an alternative to what is already out there.

A big challenge was time management was an issue from the start as I was set to begin a travelling project within my company, taking an additional summer class as well as closing on a house at the end of June. Since this new project was different than what I had been doing previously, it took up extra hours of my day because I needed to get myself up to speed quickly. I also had tons of appointments and
paperwork with the upcoming house settlement. Once the house settlement came and went, my work load on my traveling project coincidentally increased as I was giving more responsibilities in regards to upcoming releases set for early to mid-fall. All in all, it was very difficult to manage my time with everything.

Another challenge on top of the previous one was that I was not doing any coding day to day at work and so I was not gaining much experience with JavaScript, jQuery, PHP outside of the M.S. program after finishing the client interface class in the spring. As many of you know it's very hard to put it aside for a while and get right back into the syntax, functions, etc., like you never left. So having to familiarize myself with took a lot more time than anticipated because of having to Google, use stack overflow or look up documentation of functions I've used in the past. After a while though, it all started comeback.

The two free Speech Recognition API's that I selected, both annyang! and Web Speech API had difficult times recognizing the simple words like “I” or “a” or “am”. Which proved difficult to work around and so after a lot of consideration, I had to put the Speech Recognition aspect of the project to the side. I also ran into an issue with the student board in which I wanted to use an image I had already created for the board, but it was hard to get the chinchilla to move to each checkpoint as the checkpoints would be in different positions on the screen depending on the screen’s size. The solution I turned to was created the board using divs for each part.

Another challenged I face during this project was pulling in data from the database into my JavaScript code. The first solution or workaround I implemented was passing the data into the HTML using PHP and storing it into the data-id of a div and then pulling that into the JavaScript. I did eventually realize I could just use the AJAX shorthand function ($.post) to use data from the server without having to send data to the server.

5 ZucaWords Website Walkthrough
5.1 Home Page

Students button: navigates to student login form

Teachers button: navigates to teacher login form

Student or teacher must click their respective buttons to continue.

5.2 Teacher Registration

Teacher Login

Email Address

Next

Create account

Create account button: navigates to teacher registration form

Once the teacher has clicked on the Teachers button on the home screen they are directed to the Teacher Login form. If they do not already have an account they can click the Create account button to continue to the registration form.
Once on the teacher registration form, the teacher fills out their information and clicks the Create account button. They will then be redirected to back to the Home Page and will have to click on the Teachers button to get back to the Teacher Login page.

5.3 Teacher Login
Back on the Teacher Login screen the teacher will enter their email address. Until the email address is recognized to be in the database and be activated, the Next button will be greyed out. Once they have entered a registered and activated email address, the password field will be visible and the Next button will be clickable.

The teacher will then enter their password and click Next to log in.

5.4 Add a Class

The teacher home page will greet the teacher by first name as well as display all of their classes they have added. If there are no classes then the teacher can add a new class by clicking the New class button.
Here at the Add Class form, the teacher must enter a Class name as well as their student's first and last names. They can currently add up to 30 students. Once they are done adding in the names, they must click the Submit button to continue and they will be redirected to their teacher home page.

As you can see, they have successfully added a new class. To get the class's home screen the teacher must click on the class name.
5.5 **Class Home**

On the Class Home screen, the teacher can view the class password as well as the navigation buttons.

### 5.5.1 View Student Info

This screen allows the teacher to view student info – first name, last name, username.
5.5.2 View Class Progress

This screen allows the teacher to view Class Progress – first name, last name, current level, total points, pellets, stars.

5.5.3 View Test Results

This screen allows the teacher to view Test Results – they can see results for each level (or list) by color.
This screen shows test results for the red list (level 1). They are blank because none of the students have taken a test yet.

5.5.4 Add Students

This screen allows the teacher to add more students to their already created class. They can add from 1 to 30 extra students. Once they have entered the names they must click the Submit button.
As you can see both students were added successfully.

5.6 **Teacher Sign Out**

Teacher can click Sign out to exit back to the ZucaWords home page.
Now that a class was created above, we now have students to log in.

I’m going to choose Andrew Carnegie whose username is ac26.

Class password for FirstGrade2016 is abc4

After clicking the Students button on the home page the student is now directed to the Student Login form. This form is like the Teacher Login form in the fact that not until an existing username is entered (in this case ac26) will the password field show as well as the Next button be clickable.
Once an existing username is entered, the student can then put in the class password (in this example abc4) and click Next to log in.

They are then brought to the Student Home page where they can see what level they are as well as how many stars and pellets they have collected.
5.8 **Student Board**

After clicking the Play button on the Student Home page, they are navigated to the above Student Board page where it displays their progress on their current level (list) in this case they are level one and so they are on the red list. In order to progress to level two they must collect all 5 of the stars and then they will move on to the next list (after red is orange and the background color will change from red to orange). Once on this page the player is urged to click the moving pellet to play the first game.

5.8.1 **The Matching Game**

Once a pellet is clicked, they are navigated to the Matching Game page and welcomed by the matching game home screen. They must click Start to begin.
After they click the Start button, the Matching Game board is created.

When a correct match is made, both cards slide to the center and then fade and reappear to the left.
Once all the matches have been made, the student has won the game.

After you hit the next button, you are brought back to the Student Board screen and you can see that the student has collected one pellet and the next pellet is now moving. They must click the now moving pellet to move on and play the matching game again.
After you play again and collect the next pellet you can play the star game to collect a star. The student will then select the moving Star.

5.8.2 Star Game

Once the star is clicked, they are navigated to the Star Game page and welcomed by the star game home screen. They must click Start to begin.
Once they click start they Star Game board is created, but they must wait a few seconds until the cards have been flipped over to begin.

Once all of the cards flip over they are ready to play.
After they have found all of the correct cards they win a star and after they click next, they are then redirected back to the student board.

To sign out, the student must click the home button at the top left to navigate to the Student Home page.
Once here, the student can click Exit to sign out and return to the ZucaWords home page.

6 Lessons Learned

One major lesson learned is that an out of date work plan is not helpful. Because I had to throw my original work plan out the window and basically forced myself into coding on a shorter timeline without giving myself enough time to update my work plan. I also realized, although it goes without saying that I need to keep practicing programming even when I’m not working on programming at work. It’s hard to find time if with a heavy work load but it would have saved me a bunch of trouble.

I think the biggest lesson I learned was that if a feature is not a showstopper you have to realize that and put it to the side as soon as possible no matter how important you think it is. After doing research into speech recognition, I chose the Web Speech API and then I let work fill up my available time because I thought the hard part was done and I still had no idea how I was going to implement this as I hadn’t started working on the matching game yet. I still hadn’t fully tested it at that point and for two weeks thereafter. Finally when I did test it, it turned out that it wasn’t exactly what I was looking for and so I had to begin my search all over and so I selected annyang! I tested this new speech recognition API and it seemed as though it was working until I started to build the matching game and it turned out not all of the words were being recognized. After a few weeks I decided to take the speech recognition part out and focus on building a function website without it and come back to it once I was done with everything else.

7 What’s Next?

Going forward I want to look further into Google Speech API which can be used with a paid subscription to Google Cloud Platform. As well as looking into other Speech API’s that integrate well with JavaScript even though they might cost some sort of paid subscription. I would also like to find a friendlier and less robotic text-to-speech (TTS) API or software that can be downloaded and used on the website.
With the addition of at least the more friendly TTS I would like to host the website on a public server so it can actually be used by students. My goal isn’t to stop here now that I must turn in my capstone project. I would actually like to continue the development of this and see if I can get it to be what I originally envisioned. Test and ensure cross-browser compatibility and make it fully responsive so students can play at home even if they don’t have access to a laptop and google chrome browser.
Resources


7. Youtube, Google and Stack Overflow