

CS 545 F20

Sense (Gaming)

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Description

Multi-player game-based interactive learning platform that makes it fun to understand and know each other.

User-generated multiple-choice quizzes can be created and accessed via Browser.

Different types of quizzes to choose from Movies, General Knowledge, Places and more.

Targeted E - Engaging

The team has focused on the engaging aspect of design

- We want the simulation to be thought provoking yet enthralling enough to keep the user engaged and focused on the tasks at hand
- Difficult subjects require effective methods of teaching. Must be engaging and fun to use
- The results of the user decisions will challenge the user's decision making. Thought provoking enough for the user to feel the gravity of their decision
- The user should walk away with a fun and better view of understanding any topic.

Why Engaging?

Our vision for Sense was of an educational game type of webapp. Games are very good at keeping people's attention, and given this Engaging made the most sense for us. The idea of quiz should provoke the user into thinking carefully about their decision. We want our questions to be educational, as well as entertaining so that they stay on the website. We knew that going in, this would be our greatest challenge, so we decided that the E - Engaging would be the best for us to focus on.

Measure of Improvement

We can measure the improvement of the “E” selected by looking at the number of visits by the users, hours of activity for each visit and number of quiz attempted by the user. The repetition help us track the user activity. The number of games/quiz played and created; click rate can also be used to measure the improvement. These details can be viewed only by admins. Google Analytics helps track user visit and counts to keep note of engaging activities.

Google Analytics

Keeping track of how long a user spends on a page is an important factor in trying to determine how engaging our webapp is. Google Analytics is very helpful in this regard, and lets us see the statistics that we need to know to see if we are improving the engaging aspect of our webapp. The goal is to get the users to spend long enough to at least play the quiz. If they quit before enough time had passed to ensure they played through the quiz, then that would be an indicator that our web app was not engaging enough for those users.

Target Population

Our target audience include all ages and genders. Anyone interested in gaming or fun quiz can play. It is a social learning which can be used more by the school teachers to post their quizzes.

Preliminary User survey results

Here is the questionnaire that we prepared to check with the user about their preferences for a remote learning experience.

Most of the school-going parents responded that Khan Academy and Kahoot are the most preferred applications used by the students and teachers for assignments.

If the questionnaire is filled and submitted, responses from others can be seen.

Survey Link: <https://rb.gy/jr1afl>

Industry Sources

- Questionnaires/Surveys
- Question-Answer dataset from Kaggle (We have chosen some question-answer set from Kaggle. <https://ai.google.com/research/NaturalQuestions>)
- Ideas from similar applications like Kahoot, Quizlet and Khan Academy

Existing solutions and their shortcoming

Kahoot	Quizlet
<ul style="list-style-type: none">● Can create quiz but not flashcards● No microbreaks	<ul style="list-style-type: none">● Can create flashcards but not quiz● No microbreaks

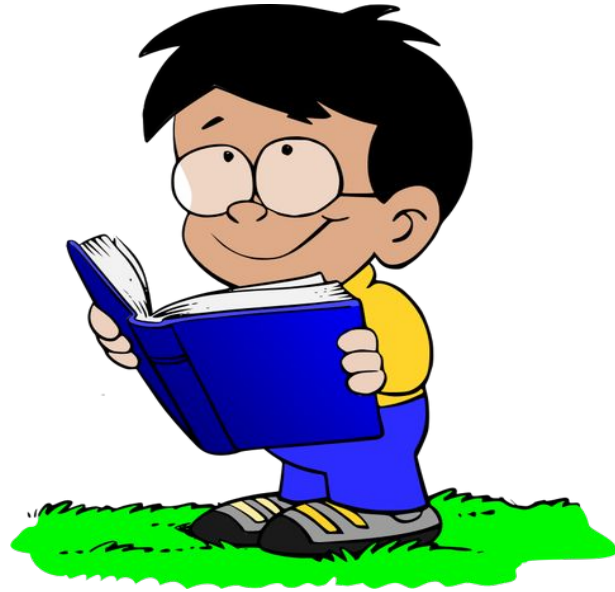
Sense can engage users in Quiz as well as Flashcards with friends and in a interactive community with microbreaks.

Additional performance feature - Microbreaks

Microbreak is one of the patterns of Tidwell to design interfaces. It means using applications as time fillers. These may be sometimes productive or relaxing from a hectic schedule.

Student Persona

- Name: John Richards
- Family: Single
- Occupation: Student



Excerpt from Persona Document: John is a 11 year old student from NY. John is very competitive and enjoys playing interactive games with friends. He is looking for a gaming portal to play quiz and create flashcards , and is even the president of his Game's club.

Initial Prototype Design

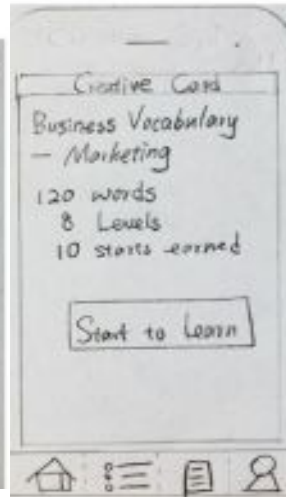
Sign In Screen



Sign Up Screen



Start Course



Start Learning Flashcard



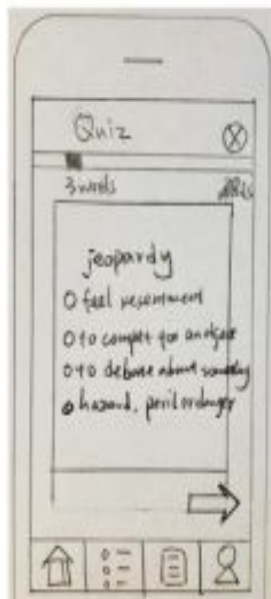
Flashcard Backside



Learning Flashcard



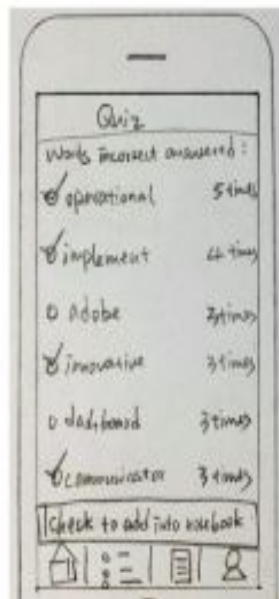
Start Taking Quiz



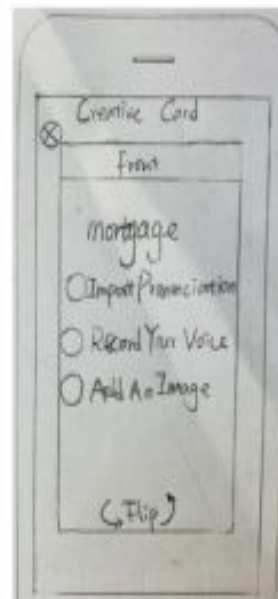
Working on the quiz



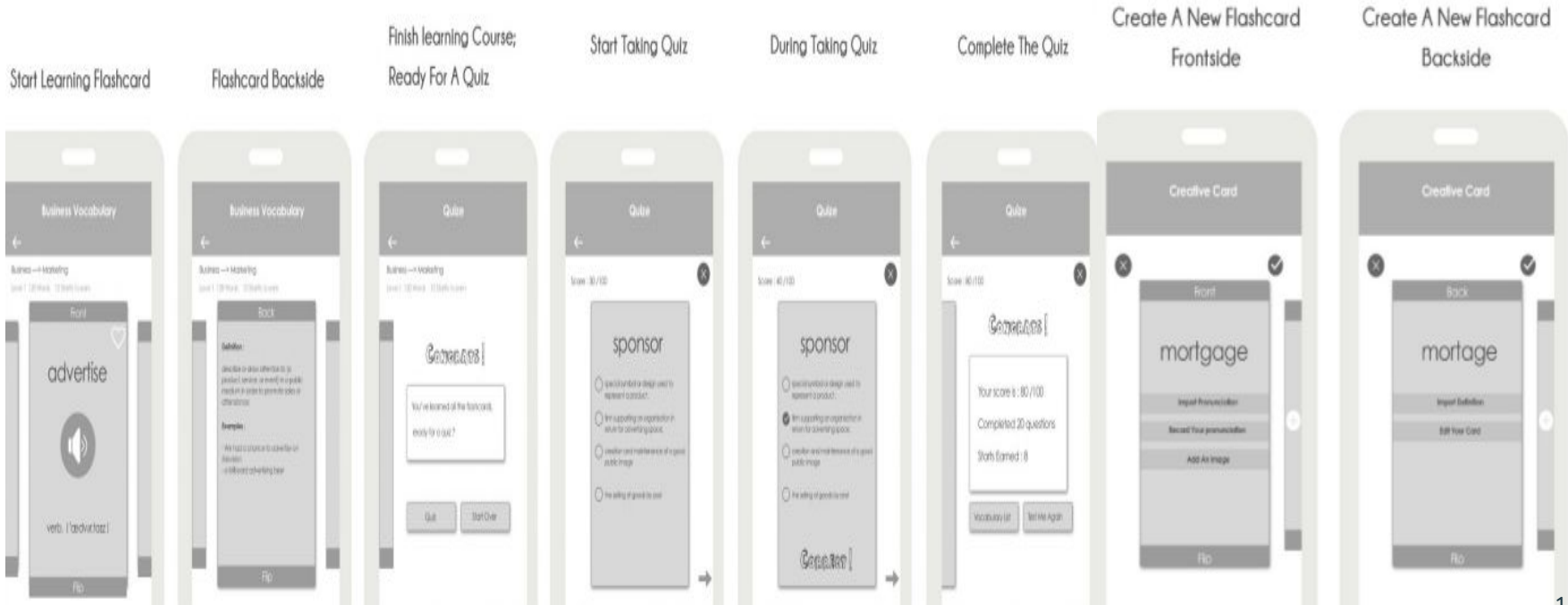
Complete The Quiz



Create A New Flashcard
Frontside



Second Phase WireFraming



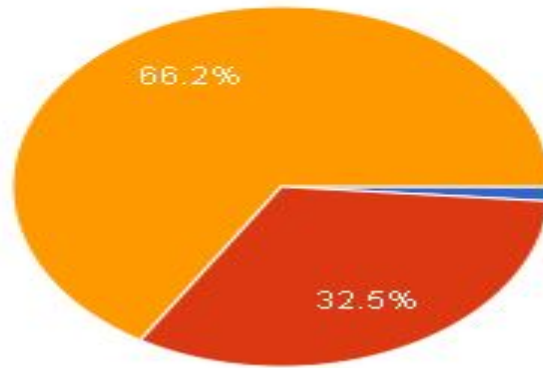
Each Iteration review

- **1st Iteration:** Our web app's initial phase of User interface & wireframing process
- **2nd Iteration:** Added Cloud storage using Google's Firestore DB
- **3rd Iteration:** Added Google Analytics for improved performance and to track user activities

User Feedback Overview

What age group are you in?

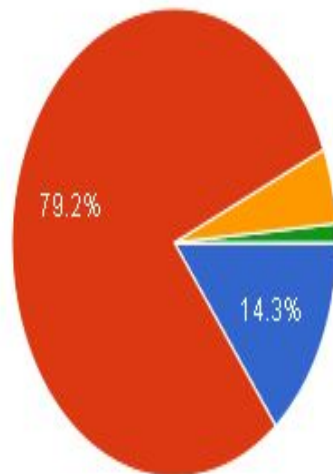
77 responses



- 21 - 30
- 31 - 40
- 40 and above

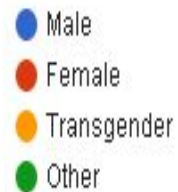
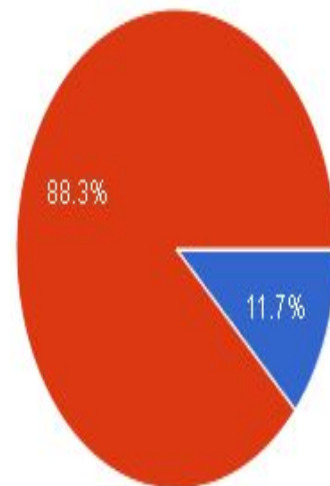
How many kids do you have?

77 responses



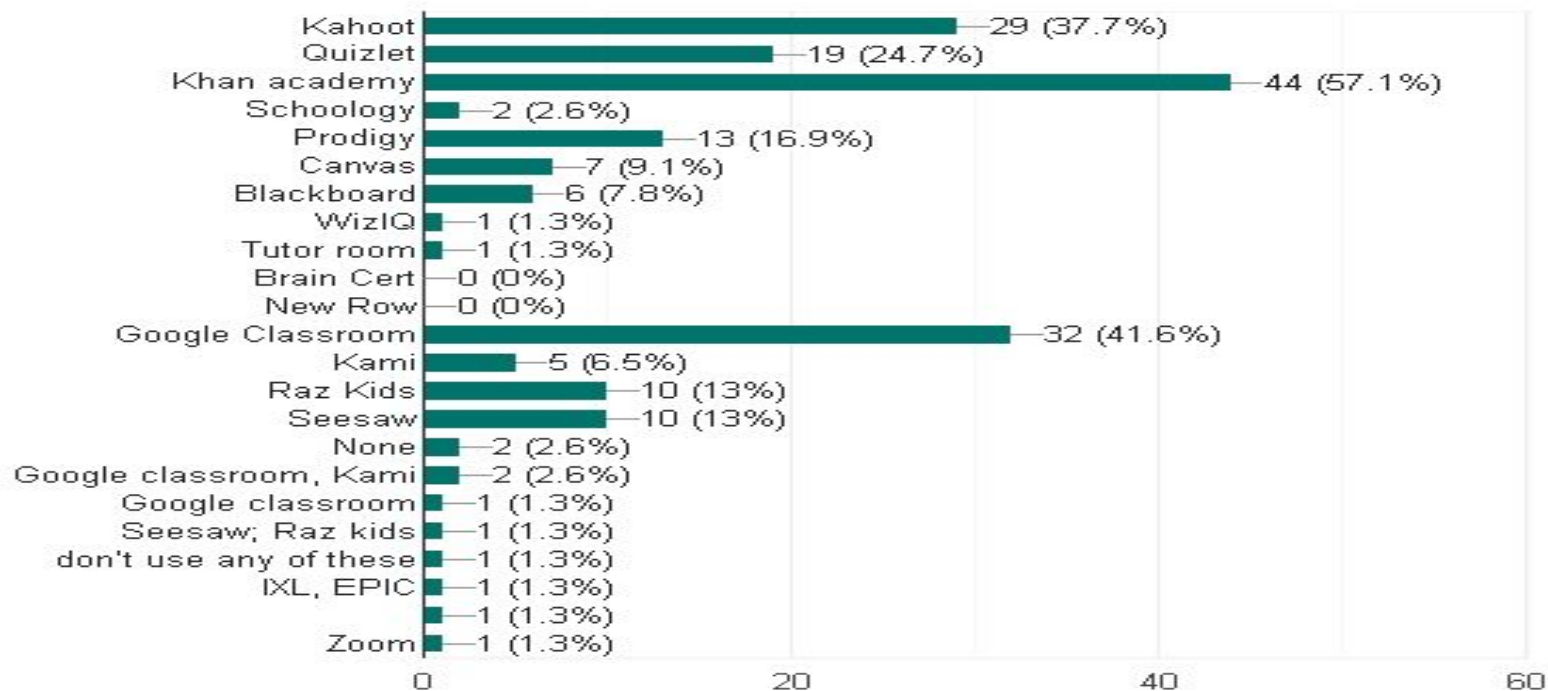
What is your gender?

77 responses



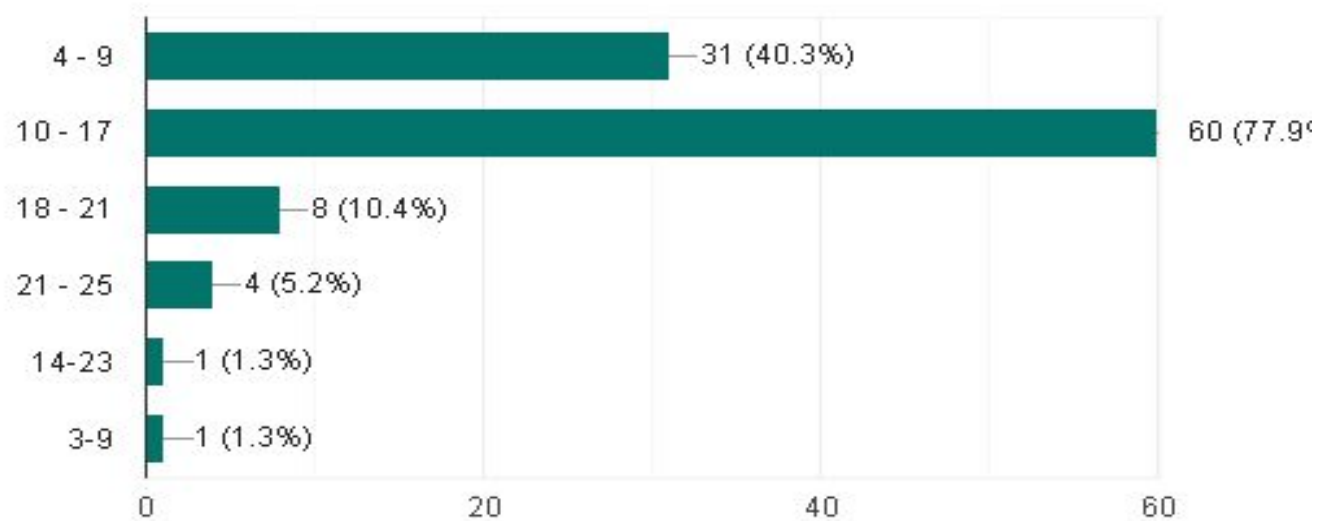
Which education-related software do you prefer the most from below?

77 responses



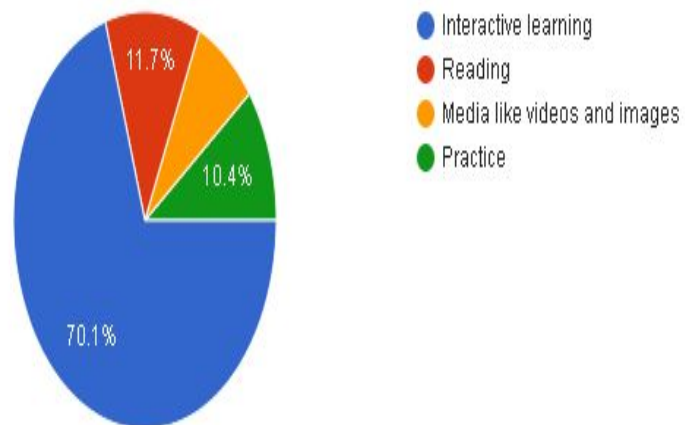
What is your kid's age range

77 responses



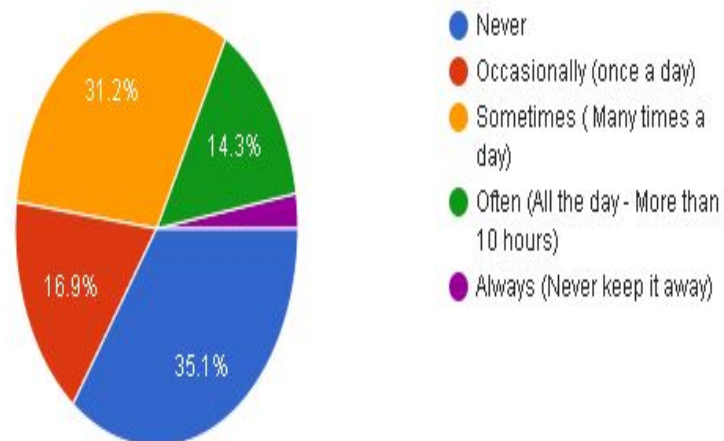
What do you think is the top priority in remote learning tools?

77 responses



How frequently does your kid use cell phone for education?

77 responses

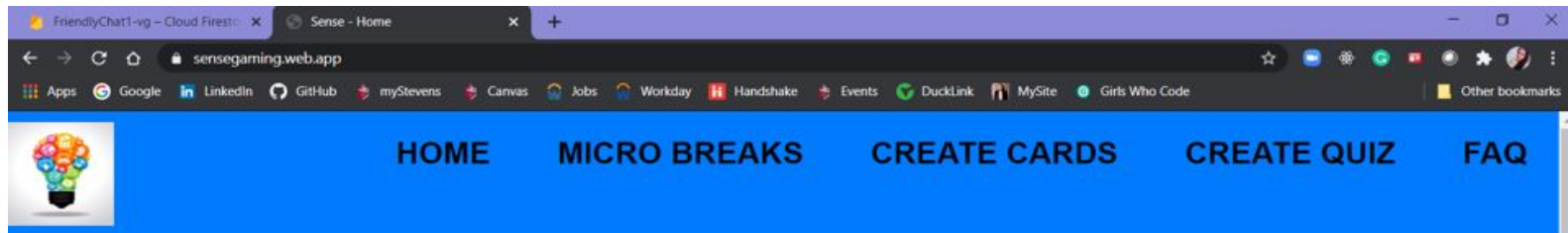


Demo of Final Design:

Link: <https://sensegaming.web.app/>

Youtube link for the demo: <https://youtu.be/C8HVG3h19M8>

This is the final iteration of the webapp. We hope that this will be entertaining to play through, and interesting enough to share with others.



Sense Around You!

At home:



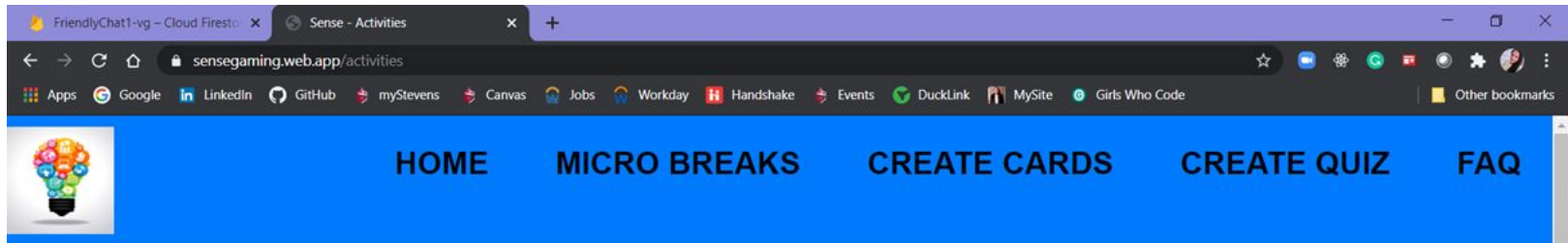
Learning and games for family fun or home study.

Sense makes studying awesome - together!

Study leagues within the Sense app connect and engage learners with friendly competition.

At school:





Virtual Activities for a Break!

[Virtual Museums](#)
[Outside Inside](#)
[Recreate Iconic Food](#)
[Online Classes](#)

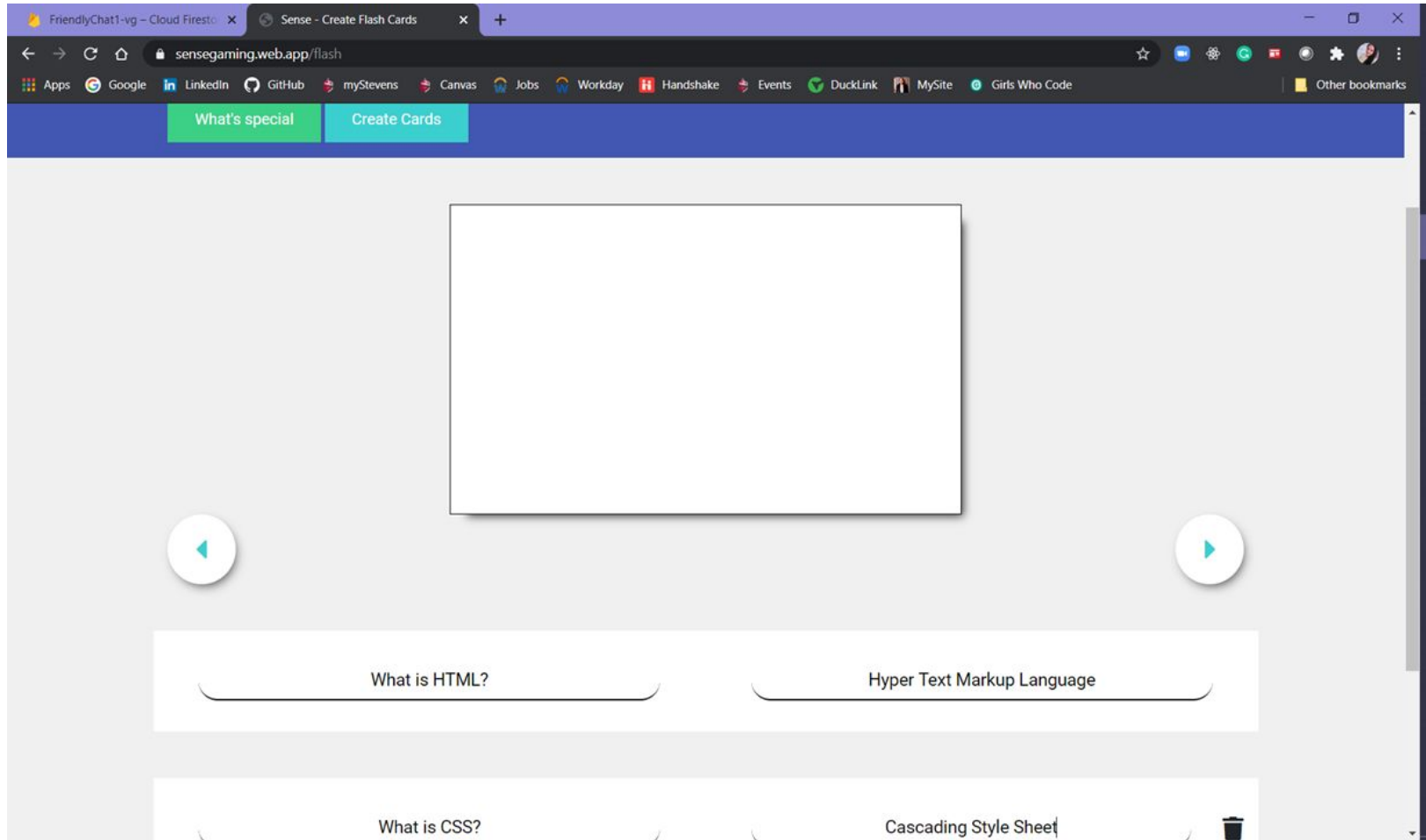
Create:

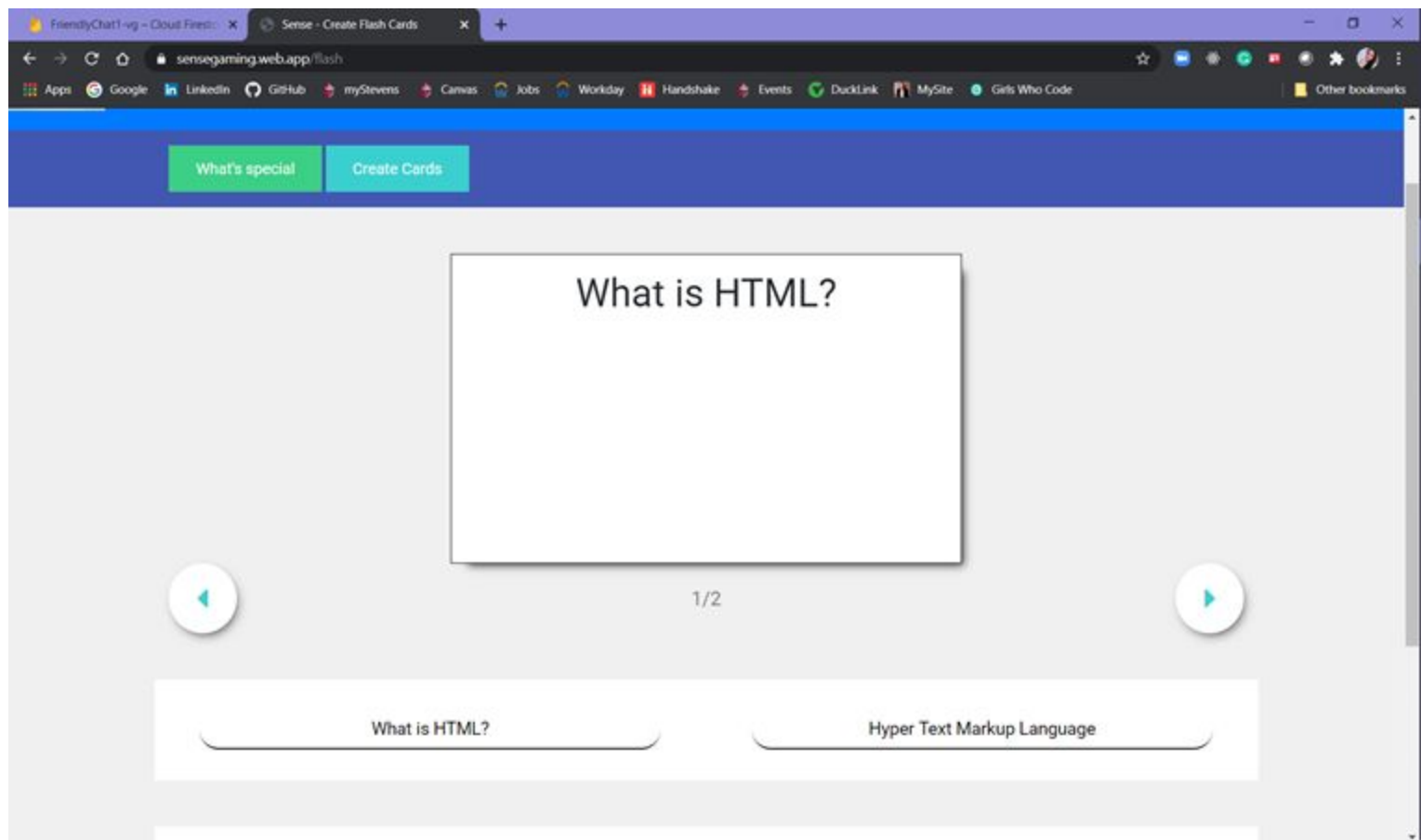


It only takes minutes to create a learning game or trivia quiz on any topic, in any language.

Host or share:







FriendlyChat1-vg - Cloud Firesto x Sense - Create Flash Cards x +

sensegaming.web.app/flash

Apps Google LinkedIn GitHub myStevens Canvas Jobs Workday Handshake Events DuckLink MySite Girls Who Code Other bookmarks

What's special Create Cards

Hyper Text Markup Language


1/2

What is HTML? Hyper Text Markup Language

FriendlyChat1-vg - Cloud Firesto x Sense - Crete Quiz x +

sensegaming.web.app/createquiz

Apps Google LinkedIn GitHub myStevens Canvas Jobs Workday Handshake Events DuckLink MySite Girls Who Code Other bookmarks



HOME MICRO BREAKS CREATE CARDS CREATE QUIZ FAQ

Add Quiz

Question:

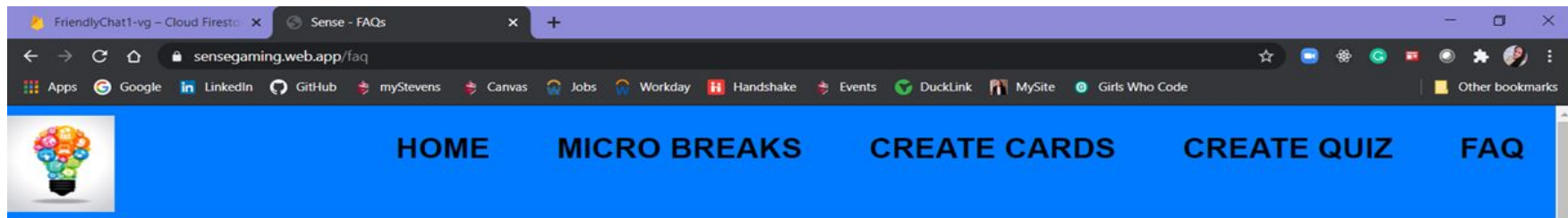
Answer:

Submit

Question:

Answer:

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1. Account Setup and settings:

****Account sign up & login link****

2. Reset Password:

****reset pwd link****

3. Subscription Fee:

None

4. Can user have two separate accounts(Teacher + Personal user):

Option in Profile user type settings

5. General Info:

****About us link****

6. Support query:

****mail to: support@sense.com****

7. How to play:

****Demo Link ****

8. How to create a quiz:

Go to Create a quiz **inserts link page and enter questions to submit and invite others**

9. How to Refer friends:

Use referral code provided in Profile settings under Referral tab

10. How will poor connection affect my quiz:

While giving a quiz if your connections weakens, the application will save time and question to continue where stopped incase of lost connection.

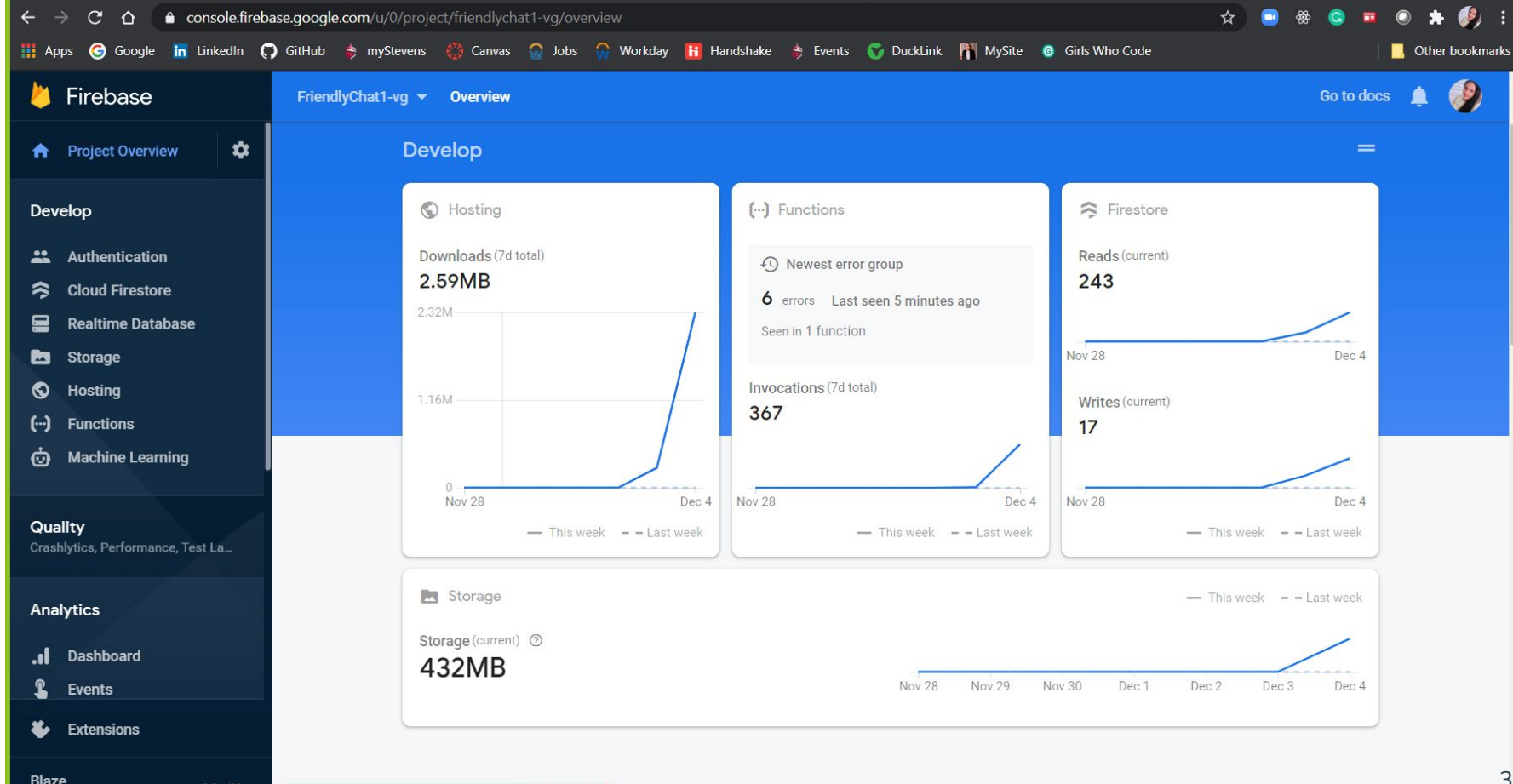
11. Can I give the same quiz more than once:

This feature is upto author creating the quiz, while setting up the option of Allowed Attempts is set and visible to every participant.

Database - GCP Firestore

The screenshot shows the Google Cloud Platform console for a project named 'FriendlyChat1-vg'. The left sidebar is the Firebase navigation menu, with 'Cloud Firestore' selected. The main area shows the 'Data' tab for the Firestore database. A breadcrumb trail indicates the path: 'form_data' > 'Bfb4MIKmlJUFz...'. Below this, there are three panels. The first panel shows the 'form_data' collection with a '+ Start collection' button. The second panel shows the 'Bfb4MIKmlJUFzQQIJeVN' document with a '+ Add document' button and a list of documents: 'form_data' (with a sub-collection 'quizzes') and 'Bfb4MIKmlJUFzQQIJeVN'. The third panel shows the document's fields: 'firstname' with the value 'Test Question' and 'lastname' with the value 'Test Answer'.

Cloud Firestore location: us-east1



Username



Password

Login

Cancel

Forgot [password?](#)

PAR Review

Perception: Grouping similar activities like learning a subject in a menu, playing options in another menu, and quizzes option in another menu.

Attention: Our game will display appropriate command for every user action. Example: When a user gives a wrong answer, it says wrong and the option to Try Again.

Retention: We will repeat the question again and again when they give an incorrect answer. So, they do not have to memorize. Repetition makes the question stay in Long term memory.

The webapp is attractive and comfortable in its design. The design is consistent and clean; using the laws of simplicity to ensure there is no clutter or excess information being presented. The pairing of context with color provides the user with a greater understanding that improves their experience and perception of the system and its expectations.

The webapp keeps the user's attention using an interactive method to simulation. The user is prompted with Practice, quiz to get their attention, and create quiz & flashcards provide the user with additional context. The feedback given to the user keeps them educated on their impacts and the correct answer available motivate the user to make better decisions in the near future.

The webapp ensures that the user is never struggling to remember information. Due to the play again, the webapp contains a tab with a brief rundown of each of their decisions and the descriptions for each. The app also provides a overview of the changes occurring; reminding them of the impact on their decisions.

Simplicity Review

A lot of information organized into designated zones in simplified ways. Home, Microbreak, Create Quiz, Create Flashcards, FAQ are in menu items as buttons. We want the user not to be overwhelmed by the amount of data available to them

Less options for the user to click

Users can become overwhelmed with too many choices

Questions can be simple to reduce number of available choices

Only available interaction points are navigation bar items for information, creation and decision windows. Less complexity

The two principles of simplicity that the team chose were organization and reduce. The reasoning for this is that Learning can be a tough to grasp at first and there is a lot of information that surrounds each subject. Therefore, it is important to ensure that the information is organized in a way that is not overwhelming for the user, but is immediately accessible to them. This is so there are not huge walls of text available to the user that can be overwhelming to read. The principle of “reduce” is important to the success of Sense due to the focused interactions necessary for the user to complete the simulation. Our main focus is to get the user to click on quiz and provide their answers based on the information presented to them. The answers that they can provide to these questions are simple. We did not want to provide the user with too much information or choices, in which it would just add to the complexity of the project.


Accessibility Evaluation

Sense had a difficult time to ensure that the website is as accessible as possible while also being a game. Used different websites to check how accessible the website is: Tota11y (<https://khan.github.io/tota11y/>) is one of them. Started out with many different issues for accessibility but all are fixed now with no error. Color blindness should not be an issue. Buttons are red or green; they indicate action intended clearly. Alerts are red; Fitt's Law

It was a bit difficult than we thought it would be to make our website follow the legal and suggested requirements for making it accessible. Thankfully, there are some good tools out there that can help automate the process, and can tell us what exactly we need to fix. For color blindness, we decided to make it simpler to use actual icons that has a meaning already built-in regardless of its color. This way, those users will not lose out on anything important as they should be getting the same message as other users would. We also addressed Fitt's Law by increasing the size of our buttons and forms.

The results of our Accessibility test from Tota11y (<https://khan.github.io/tota11y/>) are attached in the next few slides for view summary.

The results summary show Heading recommendation as H5 instead of H1 but that would make are font difficult to read. Hence decided to keep H1.

[HOME](#)[MICRO BREAKS](#)[CREATE CARDS](#)[CREATE QUIZ](#)[FAQ](#)[SIGN UP](#)

Sense Around You!

☒ **Headings**
Highlights headings (<h1>, <h2>, etc) and order violations

☐ **Contrast**
Labels elements with insufficient contrast

☐ **Link text**
Identifies links that may be confusing when read by a screen reader


☐ **Labels**
Identifies inputs with missing labels

☐ **Image alt-text**
Annotates images without alt text

☐ **Landmarks**
Labels all ARIA landmarks

EXPERIMENTAL

☐ **Screen Reader Wand**
Hover over elements to view them as a screen reader would




At home:

Learning and games for family fun or home stu

Sense makes studying awesome - together!

Study leagues within the Sense app connect and engage learners with friendly competition.



At school:

HeadingsAnnotate: ☒ X

~ First heading is not an <h1>

To give your document a proper structure for assistive technologies, it is important to lay out your headings beginning with an <h1>. We found an <h5> instead.


Relevant code:

```
<h5 class="pages__item"><a href="/">Home</a>
</h5>
```

Summary

Errors 1

Choosing the right color combination gave better contrast.



21.00

5.28

HOME

MICRO BREAKS

CREATE CARDS

CREATE QUIZ

FAQ

SIGN UP

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Summary



What's special

Create Cards

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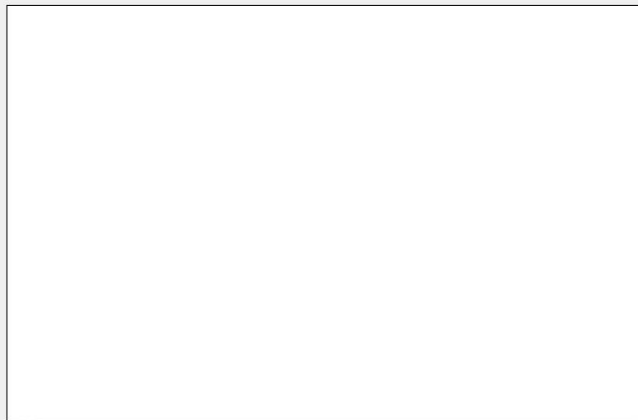
Landmarks

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- ☐ Hover over elements to view them as a screen reader would



Enter Question Here...

Enter Answer Here...

Heuristic Evaluation

Using Kessler's and Nielsen's Heuristic Evaluation points. Natural, simple language. No use of cultural phrases but instead clear, conversational language. Appropriate feedback. When a user makes a decision, the results are provided instantly alongside changes. Clearly marked exits. An exit button is given for every popup window to allow the user to come back later to a question. Prevent errors. When user selects faqs, a page assures this is the correct action requested and steps to follow for each question. Help. Tooltips available via Menu->faqs button. Consistent & minimalist design. Only provides additional information when the user requests it by clicking on nav buttons (FAQs)

- Help and documentation is available
- Help users recognize, diagnose, and recover from errors
- Match between system and the real world

The team feels that Sense performs well on Heuristic evaluation. It provides the user with plenty of ways to safely interact with the system, with clearly marked exits and the prevention of errors, tooltips for when they need a refresher, alongside detailed data based on their decisions. The results of their decisions provide them with constructive feedback to allow them to make better decisions in the near future; they are able to learn about the effects of their decisions so that they can be better informed for future decisions. The natural and common language makes this feedback much easier to digest and understand, leading to less confusion and more learning. The entire system is consistent with its design and minimal to ensure that there is not too much information at a first glance of the system. The system rewards the user with more information when they explicitly request for it; never making them feel overwhelmed with a wealth of information.

Final data from users

From the beginning, users were interested in the concept of the project, and as the project became more and more developed, the users were enjoying the gameplay, and would like to see more. The interest of the users show that this project could grow into a much more interesting project if more time could be put into it. Users seem quite happy with the final results and engagement has grown.

This project has gotten a lot of positive and constructive feedback that we are very thankful for, and it has definitely improved our webapp. We have received a total of 77 responses throughout the development of the project.

In terms of Efficiency our web app has improved performance with Google analytics and cloud storage to constantly track user data efficiently.

Targeted E - Revisited

Throughout the development of Sense we strived to make it as engaging as possible. We made various changes to make users feel more engaged. Made questions harder to answer. Results detail the effect of the statistics after each question. Added more visuals and colors. Added Cloud Storage and Analytics section. Slowed the pace of the game, so that users could have more time to observe the changes. Used our questionnaires and Google Analytics data to judge how engaged our users felt.

Our E - Engaging, was always in the forefront of our minds while developing Sense. Each iteration saw an increase in user engagement. We progressively made it more visually and mentally stimulating. Whether that was adding in more visuals and pictures, we were always striving towards that goal. We used our questionnaires and our google analytics results to judge how engaged users felt while using Sense. I think we are satisfied with how it turned out. We are keeping track of the site visits and it can be seen only by the administrator. Every time few visits increases; we feel that users are more engaged and using the application again.

Future work

As far as future development, topics based is something that immediately came to our mind.

The game should allow you to invite friends and play together.

Also, adding User analytics & performance report can help as well.

We would like to continue to work on this project, however, due to time constraints, and the amount of time that this project requires.

References

- <http://quizlet.com/>
- <http://kahoot.com/>

Thank You