CiviTutor

The Team

Project Manager: John Akers
User Researcher: Victoria Lindsay
Design Writer: Brynn Tweeddale
Prototype Designer: Nick Chang

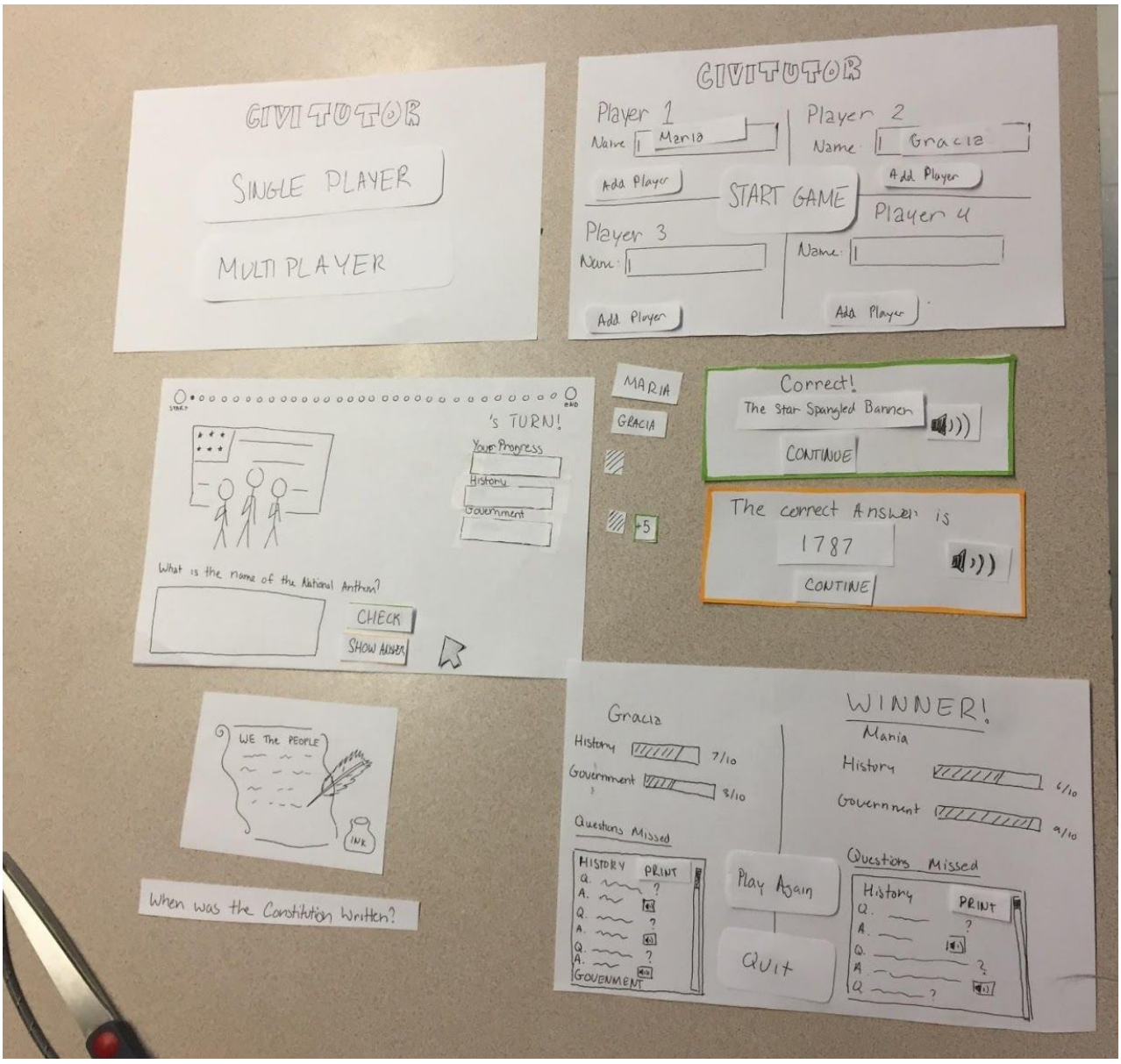
Problem and Solution Overview

Immigrants currently make up over 13%* of the American population. Of this 13%, many will be seeking to go through the difficult and long process of naturalization, or obtaining citizenship. Citizen status is important to be able to vote, work, go to school, and obtain other benefits while living in the United States. Part of the naturalization process requires that applicants must demonstrate an ability to read, write, and speak in ordinary usage in the English language. This is reasonable for the majority of applicants, but there are certain immigrant groups that due to certain circumstances are not comfortable enough with the language to allow a valid interview in English. Those with disabilities or seniors that have legally resided in the States for a certain time frame are permitted to apply for an exemption from the English language requirement, but are still required to take the civics portion in their native language.

The problem is that many of the resources created to study for the civics test are also written in English, making it harder for those not familiar with the language to study. Currently, government web pages are a great resource in studying for the tests, and are even provided in several different languages. But while these sites are accurate and kept up to date, they can be hard to navigate and find the information that you are searching for. So despite the giant trove of facts, naturalization applicants still have a difficult time becoming familiar with the information required on the civics test. Therefore, the main idea for our solution is to create a holistic study application to help immigrants better learn the questions as well as facilitate a social study environment to practice with others.

*Source: Migration Policy Institute (MPI) tabulation of data from the U.S. Census Bureau's 2010 and 2015 American Community Surveys (ACS), and 1970-2000 decennial Census.

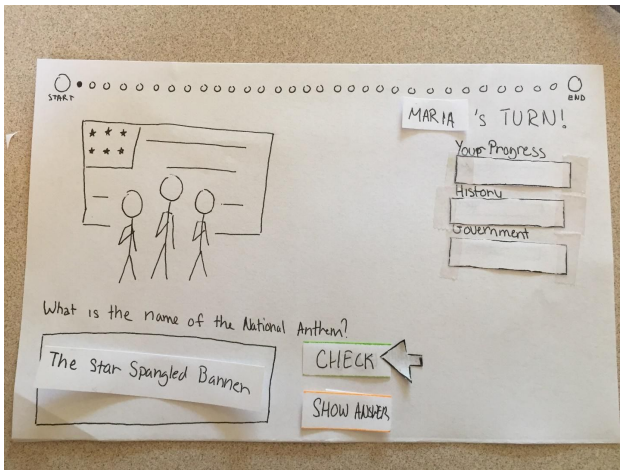
Initial Paper Prototype

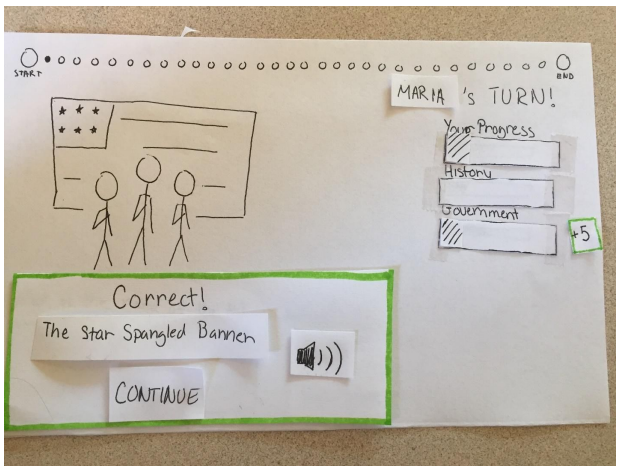


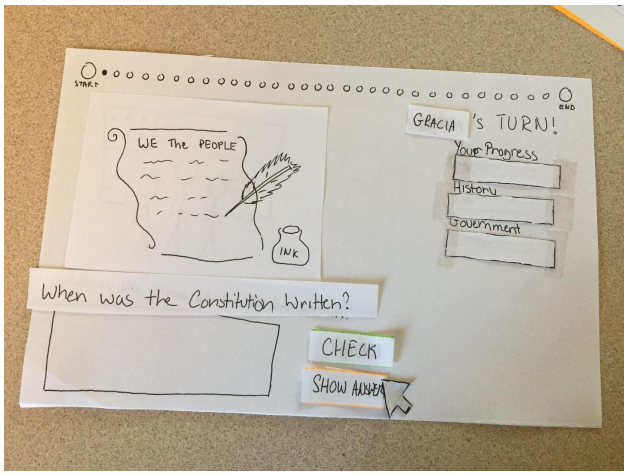
Our initial design was at its core a heavily gamified version of practice materials. The design featured a discrete scoring system during the study sessions as well as a competitive aspect in multiplayer sessions. Each study session was independent of each other with no stored information about the user's progress allowing for quick setup and play. The two main tasks of the design were for users to practice questions from the Civics test and for users to create social study sessions with other users.

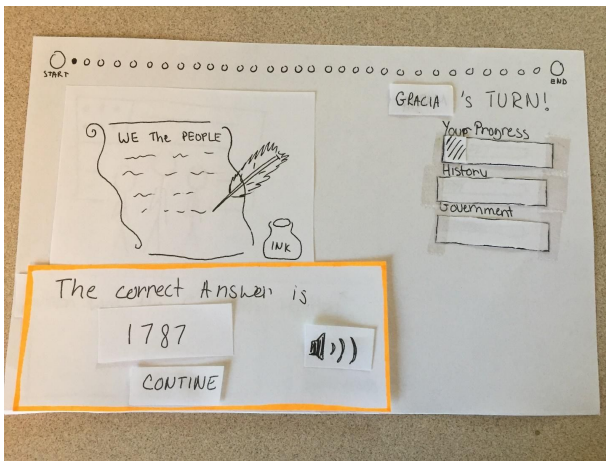
Task 1: Practice Civics Test Questions

Game Screens









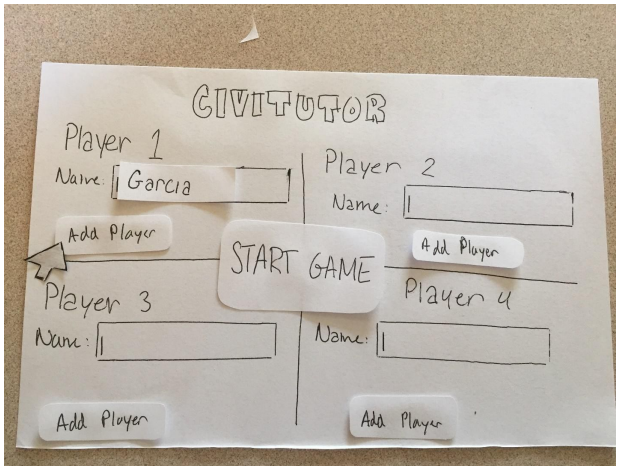
In our original prototype the main aspect that focused on helping users practice test questions were the game screens. The designs were meant to be more supportive of the user than presenting a challenge, with a variety of status meters showing how well the user was doing as well as a progress bar at the top of the screen showing the user how far they were into the current study session.

The questions themselves were presented with an added graphic to provide more context to the user about the question. Next to every response box were two options for the user to choose from. They could either enter their response for the questions and select “check” to verify whether their answer was correct or they could select “show answer” which would provide the correct answer to them incase they did not know.

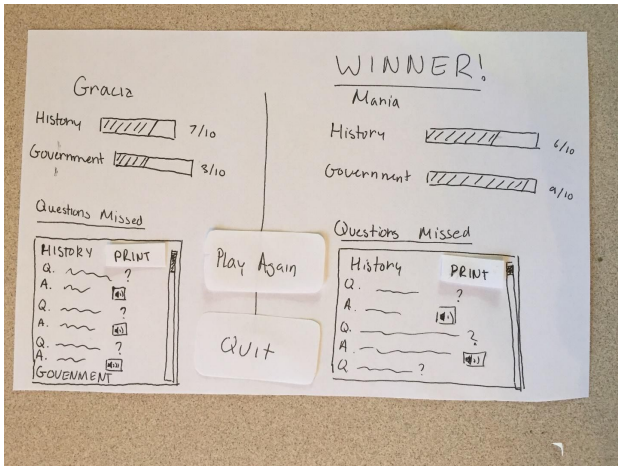
The presentation of a graphic with each question was meant to provide the user with an association to remember the questions for better practice. The multiple options to either check or see the answer were meant to make the users feel less stressed about not knowing the answer to questions and to quickly learn the answers they did not know.

Task 2: Create Social Study Sessions

Multiplayer Setup Screen



Multiplayer Results Screen



In order to facilitate natural study sessions with other users, we incorporated multiplayer functionality into our original designs. In our original prototype, after selecting the multiplayer option, users were directed to a setup screen very similar to local multiplayer screens from video games. The screen featured four partitions meant for adding two to four players to the game before beginning the session. The layout of the screen was meant to make the process of adding other players intuitive and quick.

To further facilitate the social aspect of our game we added a slight competitive aspect to the multiplayer version. At the end of a multiplayer session, just like at the end of a single player session, a results page was displayed showing the questions missed for each user and their progress per category along with specifying who did better. This element of competition was meant to make users feel more compelled to push each other to improve and further enhance the social aspect of studying.

Testing Process

During our testing process, we used two different methods: heuristic evaluations and usability testing. We started with heuristic evaluations, using two different participants. We followed Jakob Nielsen's ten heuristics for user interface design as metrics for evaluation. We then conducted three rounds of usability testing, as well.

Heuristics

For each heuristic evaluation we performed a walkthrough with our evaluators, showing each screen and describing its intended functionality. For each problem that an evaluator observed, we identified which of the heuristics it would fall under as well as the severity of the problem, from 0 to 4 with 0 being the lowest severity and 4 being the highest.

Heuristic Evaluation #1:

Our first heuristic evaluation was conducted with Alec Gumpfer who is a fellow student at the University of Washington. While he is not part of our target population, his existing knowledge of common design issues made him a good evaluator for identifying obvious flaws in our prototype that could be fixed before moving on to the usability tests.

Heuristic Evaluation #2:

Our second heuristic evaluation was conducted with Diego Serafico who is an immigrant from Mexico who was actively preparing for the Civics test. We selected him as one of our evaluators because he very closely matches our target population but has a much better understanding of technology and could provide more in depth descriptions on where there were issues in the original design.

Usability Testing

After making changes in the prototype from the heuristic evaluations (see Testing Results section), we then conducted three sessions of usability testing. Our usability tests were conducted over two iterations of the prototype with our first usability test being conducted after our revisions from the heuristics evaluations followed by more revisions to the prototype before the last two usability tests.

Usability Test #1:

Our first usability test was performed with Victoria, who is an undergrad here at the University of Washington who comes from an immigrant family. She was not the ideal target population, but we were under time constraints. We sat down with her in a quiet study room and she was given a brief overview of what the purpose of our design is. Nick facilitated both the design and logging any major incidents.

Usability Test #2:
Our second usability test was performed with Isra. He took the Civics test 5 years ago and is the same user who we asked our initial research questions to. He is bilingual and has been in the USA for 10 years. We performed the test in his home with the paper prototype. We selected Isra because he fits closely to our target population and has experience with the Civics test and conducted the test in his home to make him feel more comfortable during the test. The test was facilitated by Vicki in the format of assigning the user tasks to complete and walking through the prototype.

Usability Test #3:
Our third usability test was performed with Caro. She is Isra's wife. She is American, also bilingual. She is a user interface designer for Starbucks. We performed the test in her home with the paper prototype. We selected Caro because she provides the perspective of a family member of our target population and was involved in the studying process with the actual test taker (Isra). The test was facilitated by Vicki in the format of assigning the user tasks to complete and walking through the prototype.

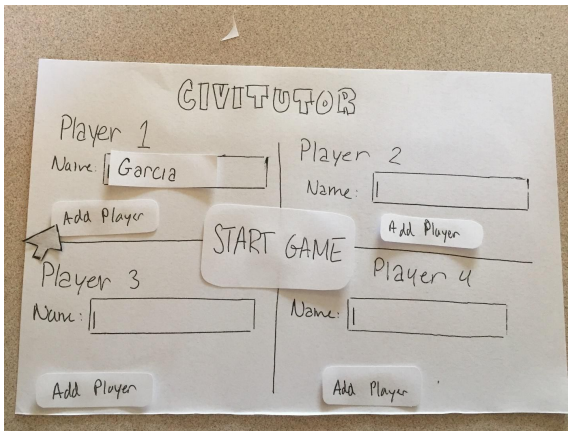
Testing Reflection:
We revised our process multiple times throughout the testing phase as we tried to follow methods that would reveal more flaws in our design that we could not predict. The main revision we made to our testing process was reducing the amount of constraints we placed on the testers during the tests. More specifically, in our first usability test we gave the user a series of specific tasks to complete and then noted where they had issues in the process. However, in our later usability tests we encouraged the users to be more open about their thoughts on each screen which revealed more general issues and functionality they expected but was not in our prototype. In our later usability test we also took more time to reflect about the overall design of the prototype with the user after the test was completed in order to receive more general suggestions about aspects that could potentially be included in the design, such as available extra detail on questions for learning more.

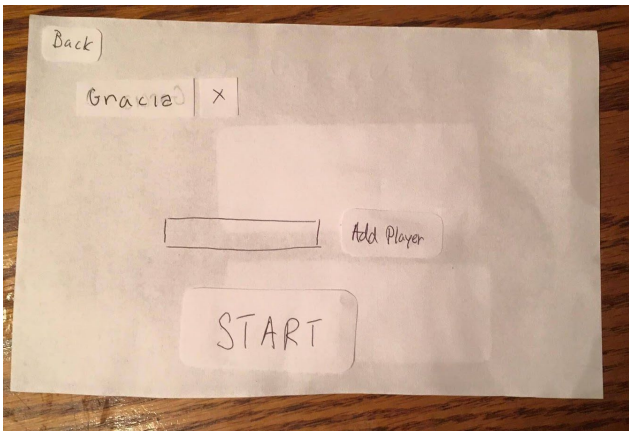
Testing Results

Overall our prototype went through three phases of revision. The first series of revisions occurred after completing our heuristic evaluations. A then smaller set of revisions occurred after our first usability test. The last phase of revisions that resulted in our final paper prototype occurred after our last two usability tests. The most prominent results and revisions in each of these phases is detailed below.

Heuristic Evaluation Results and Revisions

Multiplayer Setup Screen

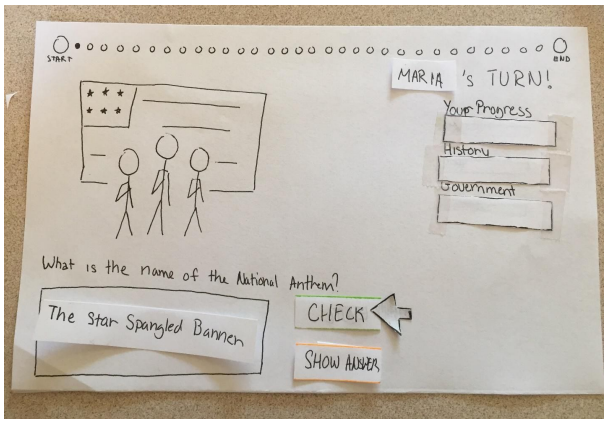


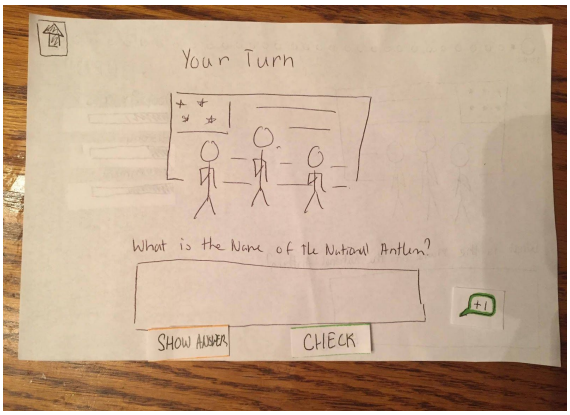


The most often commented upon screen from our original prototype was the multiplayer setup screen. Our evaluators pointed out multiple issues in the functionality such as the ambiguity in how many players were required in order to start the game as well as what the purpose of the “Add Player” button was in each quadrant of the screen.

In response to these critiques we performed a massive overhaul of the screen with a much more simplistic design of only one text box for adding players. Furthermore, we added a modifiable list in the center of the screen to reduce confusion about which players are currently in the game.

Game Screen



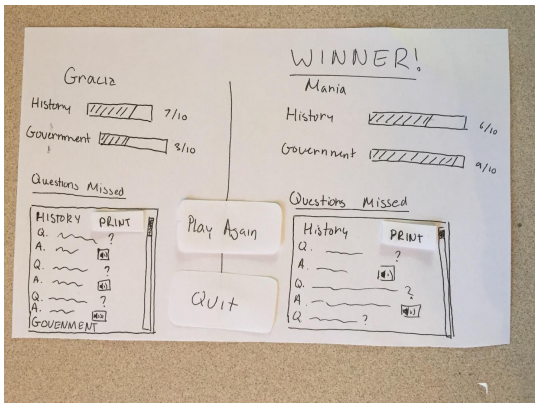


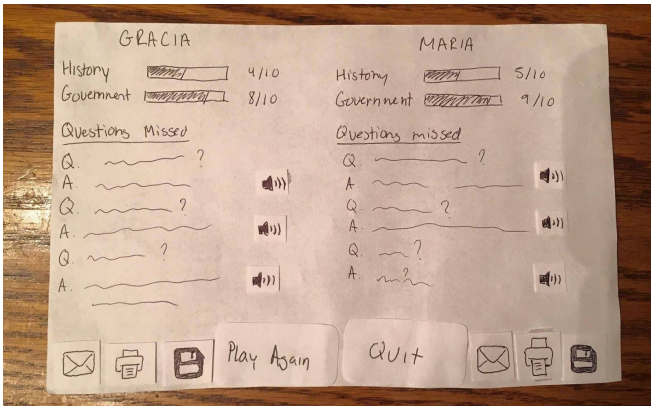
The other major flaw pointed out by our evaluators from the original prototype was in the complexity of the game screen. The feedback we received pointed out how confusing the variety of progress bars were around the sides of the screen with many ambiguous labels as well as no way to exit the game such as a “save and quit” option.

Like the setup screen, we heavily revised the game screen to become much more simplistic and easier for users to navigate. Most significantly we removed all of the progress bars around the screen to make a much more straight forward experience for users. With the removal of the progress bars we then centered the question section in the middle of the screen to give precedence to the game itself. We also added a home icon at the top of the screen that allowed users to return to the start screen at any time and continue their session if they had been playing a single player game.

Usability Test #1 Results and Revisions

End Game Screen



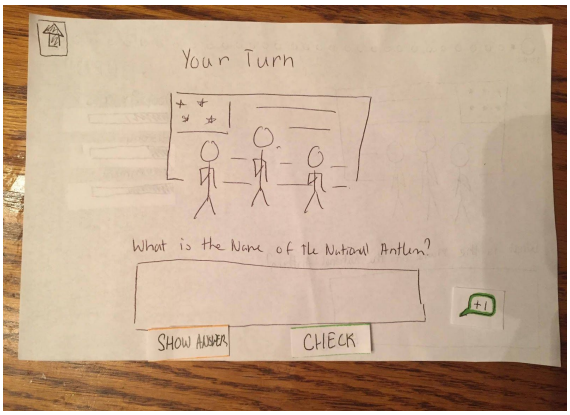


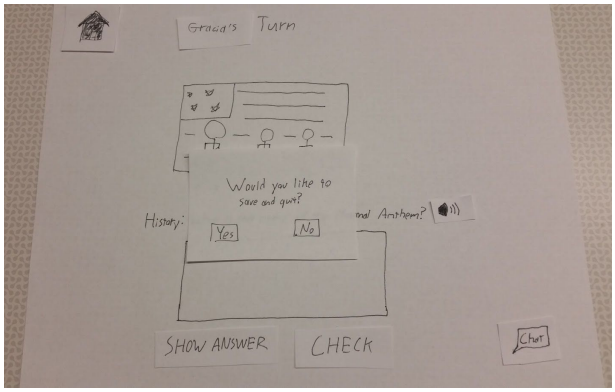
After our first usability test was the first time that we had made any drastic changes to the results page, which displays after a game finishes. We had previously received feedback from our heuristic evaluators about the screen being overwhelming and the missed questions section not having intuitive functionality. Our first usability tester reinforced these critiques with the mention of possibly not being able to print results but still wanting to save them somehow as well as the confusion of having to scroll through each missed questions section individually.

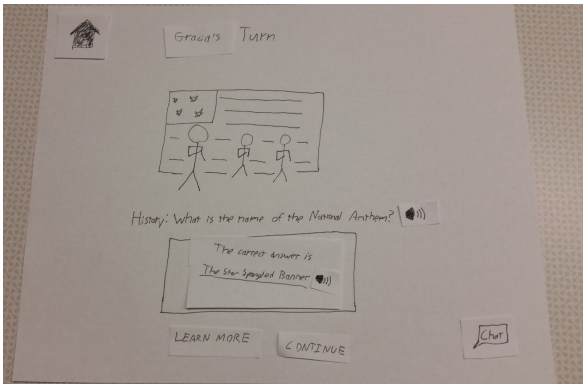
We revised the results screen following these suggestions by modifying the layout to add more visual precedence to the missed questions section than the progress bars at the top. We also added more functionality for saving or emailing the results with larger buttons that are both more familiar to users and easier to select. The last significant change was the removal of displaying a winner in order to remove the competitive aspect. This decision came from overall feedback we received about making the game more cooperative than competitive in order to reduce the stress on users.

Usability Test #2/#3 Results and Revisions

Game Screen



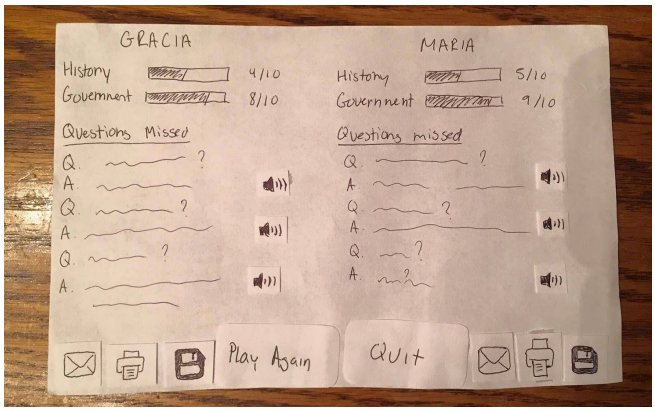


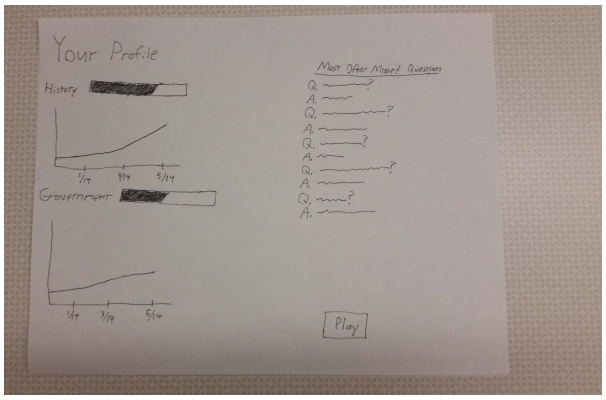


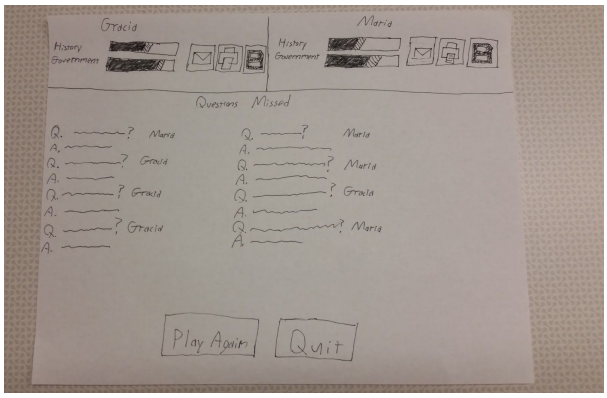
Although the last two usability tests gave mostly positive feedback about the game screen, they did reveal some more subtle issues. The first point made was how selecting the home screen did not necessarily inform the user whether their game would be saved. Another point of feedback was the expectation that selecting the graphics with each question would provide the user with more information surrounding the question. The last issue that the testers revealed was that in order to practice pronunciation they wanted to be able to hear both the question and the answer.

Our changes to the prototype from these issues were more subtle than prior revisions but to add further interactivity we created a separate dialog box for when the user selected the home icon in order to confirm they wanted to save and quit. We also added another option for when the user gets a question wrong or checks for the answer that can provide the user with extra outside information about the question. The last change was adding a speaker icon next to each question as well as the answer in order for users to hear how the questions are pronounced in English.

Results Screen



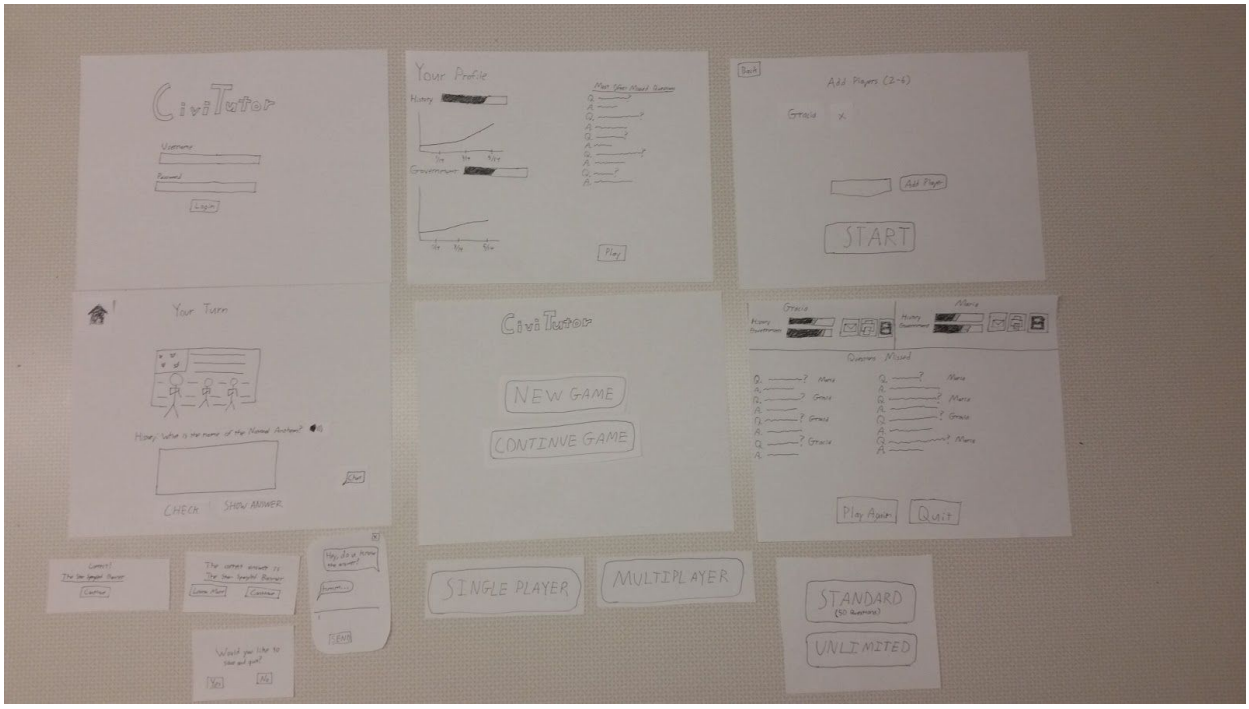




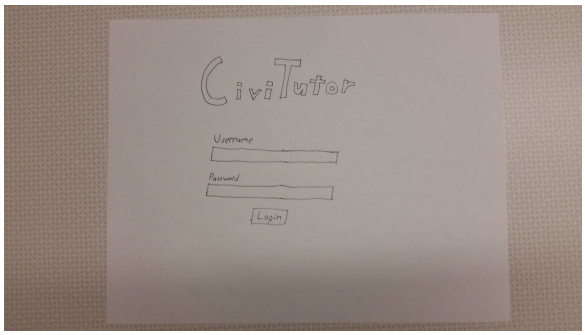
Despite prior changes to the results screen, our last two usability tests revealed many new issues with the screen. A usability issue that arose was the confusion about the placement of the email, print, and save buttons with respect to whose results they were relevant to. A comment mentioned about the overall design was the suggestion of making the progress bars track progress over multiple sessions instead of on just a per session basis as well as the desire to see frequently missed questions.

The most drastic change that arose from these suggestions was the creation of an account system in order to track the user's overall progress and reflect how they have improved. This revision included making a new profile screen that users would have to login to see. The profile screen features both the progress in each category of questions as well as the most frequently missed questions for that specific user. The results screen was then also significantly changed first by moving the email, print, and save options to the top of the screen where they would be in closer proximity to the respective player. To denote overall progress for each player, the progress bars were changed to reflect the improvement made over the session with respect to overall progress . Lastly, to reduce the amount of clutter on the page the missed questions were consolidated into one list with the name of each player that missed a certain question next to that respective question.

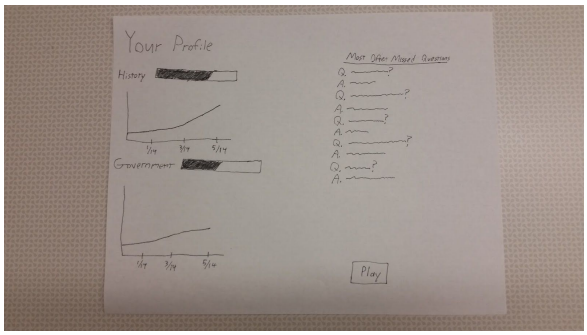
Final Paper Prototype:



Initial Login Screen



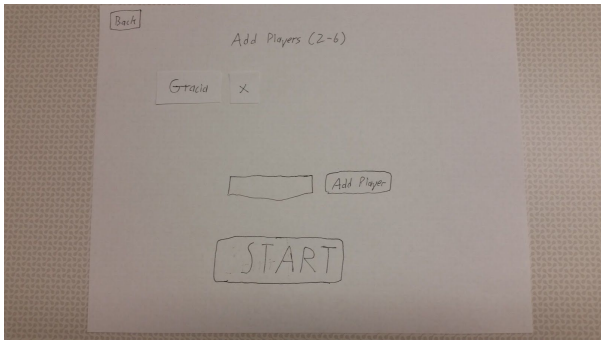
User Profile Page



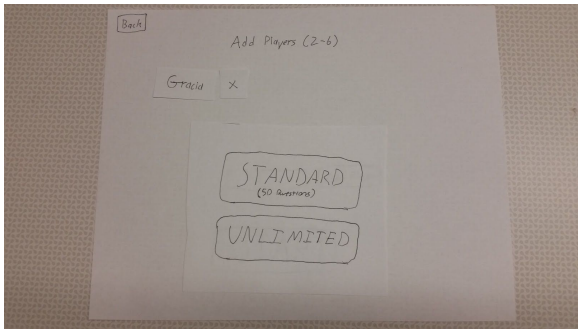
Screen After Selecting Play

Single Player vs. Multiplayer

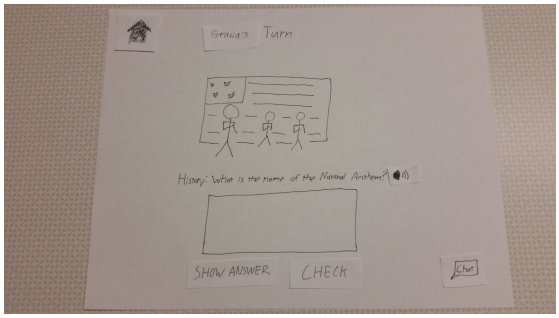
Multiplayer Session Setup Screen



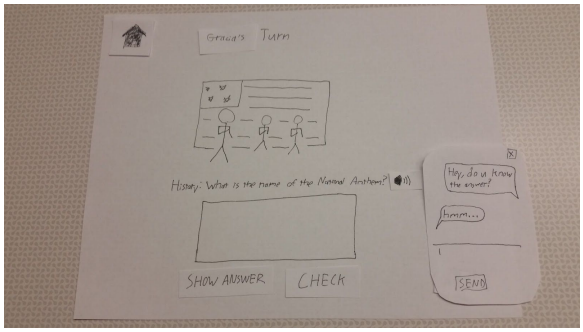
Menu To Choose Game Mode



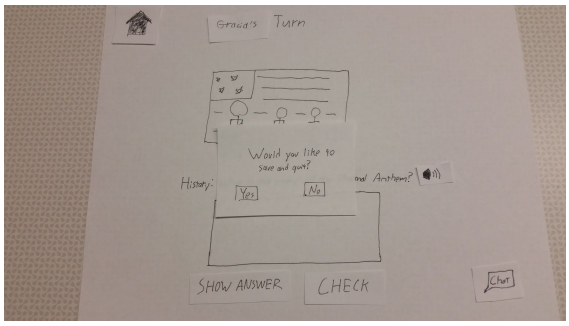
Initial Question Screen



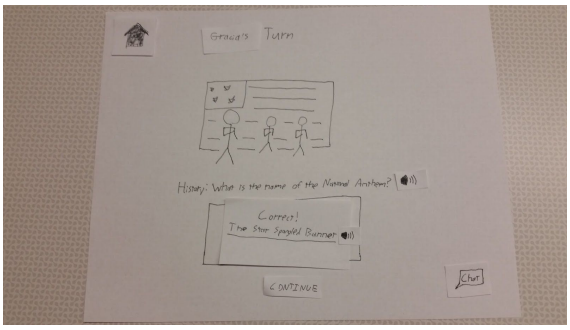
Chat Box Expanded



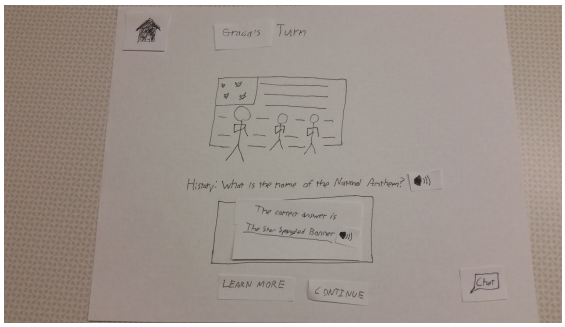
Dialogue Box After Selecting Home Icon



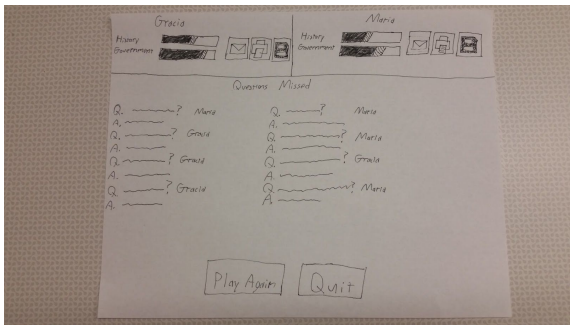
Correct Answer Response Screen



Incorrect Answer Response Screen

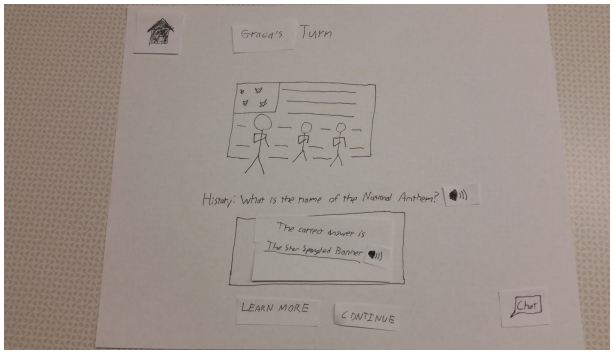


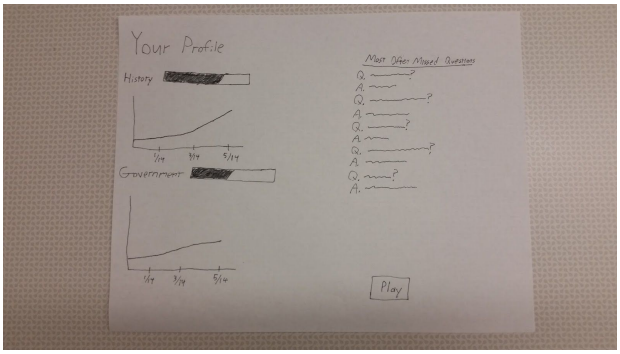
Final Results Screen



Our final prototype features significantly more functionality that provides utility to the user while still being more simplistic and lightweight than our original prototype. Over the entire revision process drastic changes were made such as adding the user account aspect that provides information about how the user has improved over time. The interactiveness of the design was also enhanced through the addition of more dialogue boxes to confirm user input and prevent errors. User control was also increased through options on every screen to quit or revert back to the prior screen to avoid leaving the user in a process funnel.

Task 1: Practice Civics Test Questions

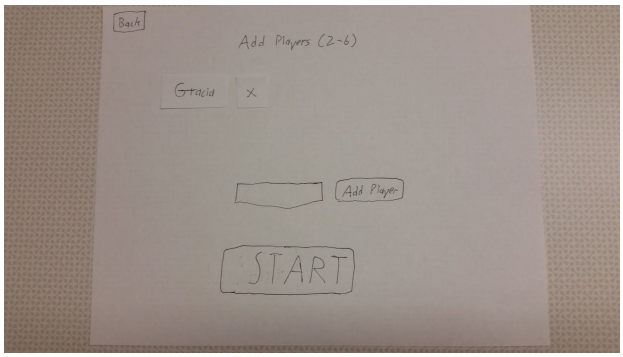


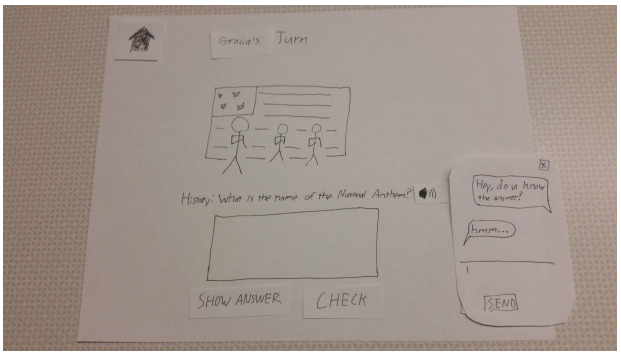


Through our research and tests we realized that to help users really practice the Civics test questions and improve their knowledge involved doing more than randomly repeating questions until everything was memorized. While the core functionality of our application is practicing the questions, the use of speakers to pronounce the questions and answers in English as well as the availability of further learning aids are what truly enable users to learn the questions they do not know.

Tracking the progress of users over time also gives our application the ability to recognize where the user's strengths and weaknesses lay. With this information we can help the user identify what questions they need further practice as well as which categories overall they need to focus on.

Task 2: Create Social Study Sessions

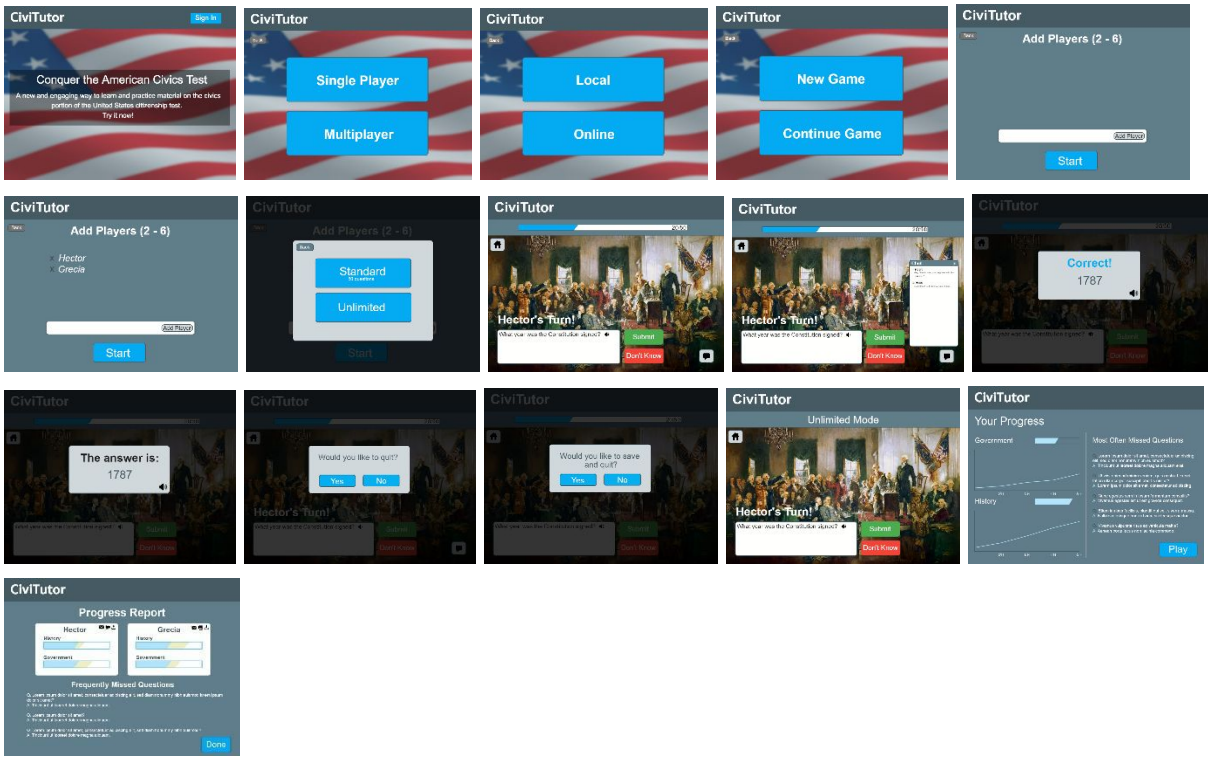




While our original prototype featured a competitive aspect in the multiplayer, in order to facilitate a more collaborative environment our final design is more directed at enabling users to cooperate. Expanding on the original idea for only local multiplayer, much of the feedback we received convinced us to add online multiplayer as well in order to increase accessibility. Much like people can converse in local multiplayer, users can chat in online multiplayer to discuss questions and help each other learn the questions and context better. Multiplayer sessions also randomly ask any of the users playing in order to keep everyone involved during the study sessions.

Digital Mockup

Below is our digital mockup:

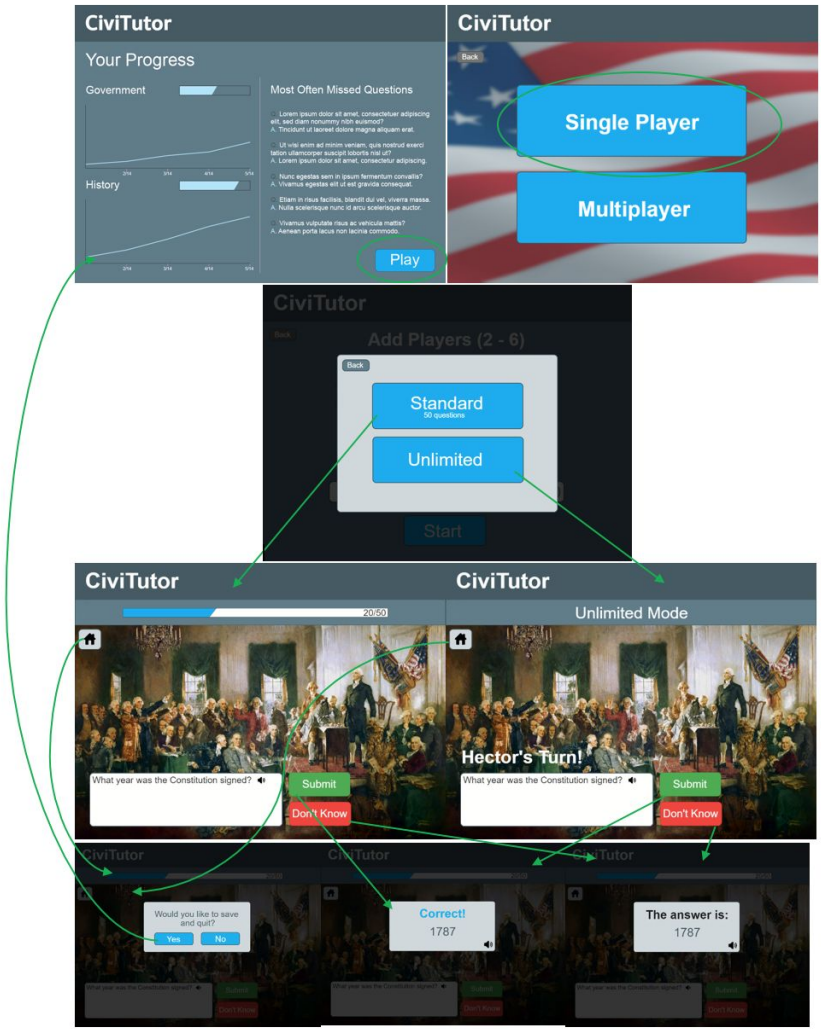


Walk Through

Start Screen:

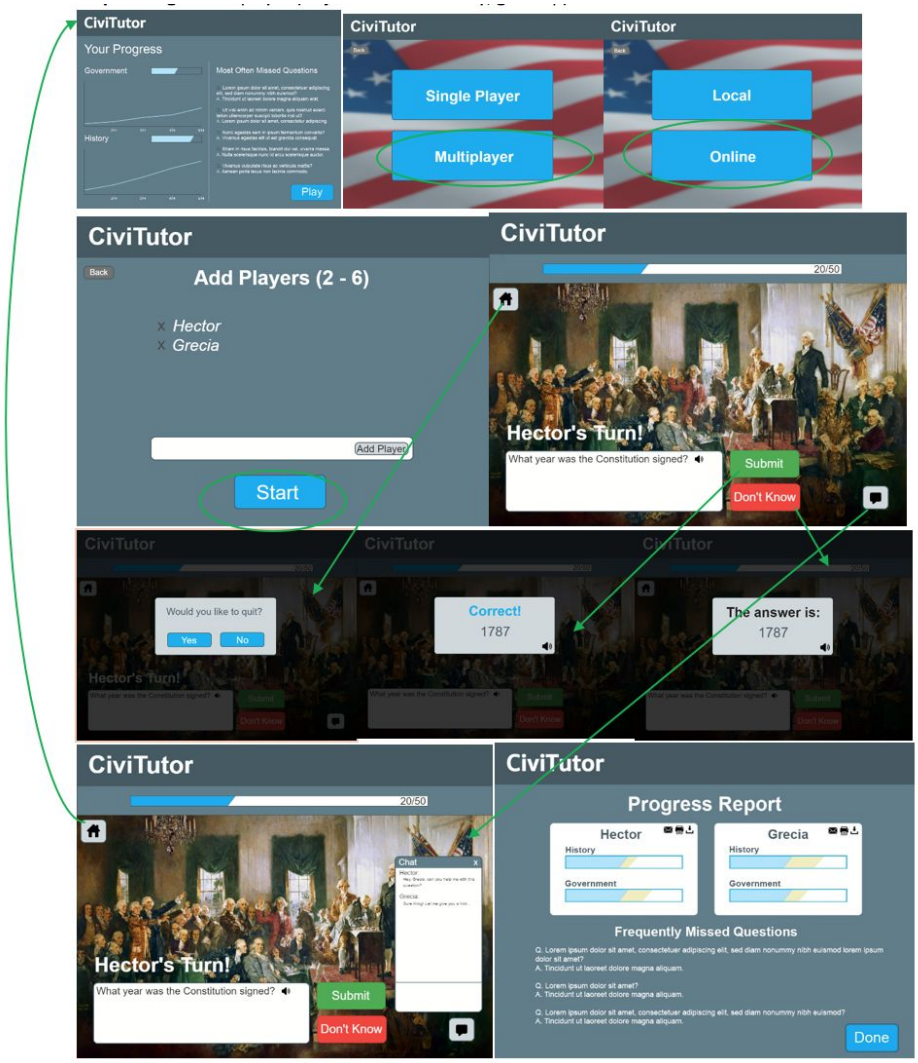
Changes: We added a sign in page so we can track a user's learning across multiple games. We added the flag and description to promote engagement and explain the app's purpose.

Single Player Process Flow:



Changes: We added a screen to allow players to choose an unlimited game play mode. We made it its own screen, rather than part of the game selection menu. This made it much clearer and less busy. We changed Show Answer, Check to Submit, Don't Know for clarity.

Multiplayer Process Flow:



Changes: We added a header “Add Players 2-6” to let the user know how many players they need. We added a sound out for the questions. We added a quit pop up (To make it obvious that pressing home doesn’t save the game in multiplayer) We also added a consistent header across all the pages (civitutor). And places the home and back buttons in a consistent location.

Primary Tasks

Task 1: Practice Civics Test Questions

The design supports our task of practicing civics test questions by providing a fun, interactive game mode that goes through sets of example questions. For each question, there is an image or animation to make it more enjoyable and also to help create more associations for end users. Whether the user gets the question correct, incorrect, or just didn't know, the application displays the answer so that they can learn it and get it correct the next time around. Furthermore, if an answer is not correct, the application logs that down, so that the next time the user plays, that question has higher priority and is more likely to come up.

Task 2: Create Social Study Sessions

The design also supports our task of creating social study sessions. It does so by allowing users to play in multiplayer mode. In multiplayer mode, there are two options: local or online. If local is selected, users can meet up with other users and play all on one web enabled device. The game will rotate between players, asking one person to answer one question at a time. Multiplayer is similar, but users can connect online instead, and to encourage more social interaction, there is a chatbox so that players can consult other players for help. The goal is for users to help and encourage other users so that they can all succeed together.

Discussion

Through the process of iterative design we learned several things. Most predominantly we learned the importance of not assuming the needs of our users. In our initial design, we were thinking of creating a simple app that focuses more on learning the material rather than practicing it. However, after speaking with many people who had studied for the test in the past, we learned that there is already enough material to memorize the questions (flash cards and a list), and that there was more of a need to practice interactive recall, and focus on learning the pronunciation. This was a big functional change, that completely reoriented the direction of our project from our initial sketches and ideas.

We also found that iterative design allowed us to continually improve our app, so it became more and more intuitive. We continually changed both large and small features, from adding new ways to use the app (multiplayer vs single player), to making the screens more readable and clear, to adding new unanticipated features like chat. Sometimes our feedback was conflicting, for example in our add players screen some people preferred to be able to add unlimited players, and others though a constrictive design made more sense. However we were able to use the feedback to continue to refine the page until both groups found it understandable.

At each step we got feedback on our sketches and prototypes, which allowed us to explore new directions. We explored the idea of a simple flash card app, a quiz app, and eventually settled on a web game. One of our main tasks was discovered through user studies, and refined through usability studies: social studying. This was not one of the original tasks that we came up with, but we learned that our target audience often uses friends to study (for example by reading each other questions), and has lots of free time due to retirement. We used usability studies and learned that a chat feature was preferred, and then further learned that this chat should be minimizable to not be distracting, but clear and obvious on the page. Our second task was to learn the test material. This task stayed mostly consistent throughout our usability tests, but through our initial user testing we discovered this learning should be more focused on practicing and interactive recall, rather than memorization.

We could have continued to iterate to improve various aspects of our design. Since a web game has so many different features, we focused mainly on the essential ones to make it usable: the main game screen, the final screen, and how to select game mode and add players. However there are many smaller features that we didn't have the time to fully flesh out and get feedback on, including logging in and tracking the user's profiles. Additionally we would have liked to get more feedback on little features we added at the end, such as how we display to the user their final results. We also generalized the game play to a single screen, and could definitely learn more from testing a full game with multiple questions, such as ordering of questions, transitions, etc. In general however we are happy with our final design. We found that our initial users, who we did our initial research on to design the app, were able to easily navigate and use our final design, and gave us the feedback that it would be helpful to them for studying. A design will always need further refinement as new features are added. In the case of the citizenship test- our app may need to be refined in the future if the test changes, or as new information about our users comes to light.

Appendix

Heuristic Evaluation Notes

Evaluation 1:
Evaluation facilitated by: Victoria Lindsay, Nick Chang
Evaluator: Diego Serafico

Flexibility and Efficiency:
-Add an option to share/email results, not just print.
Severity 1
-Allow adding users one at a time. More clear, allows multiple.
Severity 2

User control and freedom:
-Would like to save and quit game. Would like to re enter saved game.
Severity 2

Match between system and real world:
-"Show Answer" isn't obvious that it causes you to lose points for the question.
Severity 2

Aesthetic and minimalist design
-Wanted image, question, and answer more centered on the screen.
Severity 1
-Should allow scrolling the full results page, instead of the individual answers and questions. Less busy.
Severity 1

Evaluation 2:

Evaluation facilitated by: John Akers, Brynn Tweeddale
Evaluator: Alec Gumpfer

Add player button with four player slots already displayed
Heuristic: Aesthetic and Minimalist Design
Severity: 1

Unclear if four players are required to play
Heuristic: Aesthetic and Minimalist Design
Severity: 1

No option in the case of more than four players
Heuristic: Flexibility and Efficiency of Use
Severity: 2

No option to quit the game before it is completed
Heuristic: User Control and Freedom
Severity: 3

No message or response for wrong answers
Heuristic: Match between System and the Real World
Severity: 3

Progress bar at the top is unclear in purpose
Heuristic: Aesthetic and Minimalist Design
Severity: 1

Usability Test Notes

Usability Test 1 Feedback:
-Not sure how many people could/should be added in multiplayer mode.
Severity: 1

-Confusion about what all the different progress bars were for, and if they were actually related to one another. “Is the top progress bar the same as the progress bar on the side? What happens if the side ones are full? Am I done?”
Severity: 3

-Participant wondered if there was anyway to save and quit in the middle of the game, but there was not.
Severity: 2

Usability Test 2 / 3 Feedback:
-Would like a play unlimited version, where you just keep playing until you get bored- and questions you miss reappear more frequently than ones you don't.
Severity: 1

-Chat icon could be more clear/obvious but like that it's minimizable and not always "noisy"
Severity: 1

-Would like to sound out the questions as well as the answers, to know what it will sound like when asked during the test.
Severity: 2

-Would like an indication of which category each question is, and maybe a star or indicator if it is a local specific question
Severity: 1

-Like the images associated with the questions, but thought that they might be clickable or take you to learn more about the question. (For example to a website or video)
Severity: 1

-Home button isn't obvious if it will save game or not
Severity: 3

-Wants to know if the text box will correct English spelling or be lenient at all with typos.
Severity: 1

-Would like to collect missed questions over a longer period of time then one game, or have some concept of what questions he has learned.
Severity: 2

-Liked the end screen with the statistics and questions missed, but it felt a little cluttered.
Severity: 1