Stage Four

CPSC 481 - TUT 01
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Online Portfolio: https://481raafat.github.io/websitetest/
Repository: https://github.com/teddy-kalp/CPSC481-TEAM-C/

I. Project Description

For students in their youth, the importance of education is vital in ensuring those students will be able to learn valuable lessons in and out of the classroom. We believe we can create a mobile tablet-based education and teaching application for teachers to incorporate into their curriculum. Our app, *Teachio*, will be designed to create an enhanced student learning experience using a simple, easy-to-use, and customizable design while also delivering a handful of useful features. These features include interactive learning using a live lesson plan that is provided by their teacher, the ability to write down notes in their tablet, checking up on upcoming important dates and being able to write quizzes and tests right on their tablet.

How our application is going to be used depends on how the faculty chooses to use it. A main goal of this project is to enhance the experience of students inside and outside of the classroom workspace so that they feel that they are able to efficiently learn and be able to manage their time better with the convenience of our application. As for faculty, we wish to provide an application that would allow for them to easily plan lectures and events, engage more with students,, and allow for them to be more easily accessible in case students wish to reach them. Previously we discussed a feature for teachers to be able to create a lesson right in the tablet application. After much discussion we decided to remove this feature as it would make our application harder to use and less customizable for teachers to create lessons. We would like our application to cater towards a younger student audience as we believe they are the ones who will enjoy this application the most whereas an older audience will have their own preferences of applications and technology to use.

II. User Tasks

A. Teachers can add lessons from personal files and grade assessments using the application
    a. Can upload files
    b. Access lessons and present them
    c. Will also allow for assessments to be created for grades just as is done in D2L
B. Teachers can mirror lessons from tablet to a smartboard or display
    a. Teachers will be able to screen mirror from the application to a display board so that students can follow along with the lesson
    b. Teacher will also be able to mirror lesson onto student's tablets
C. Notebook feature
    a. Students can use for notes, questions, homework
    b. Teachers can use for in-lecture notes or personal notes
D. Students can respond to questions/problems that are being presented on their tablets
    a. When the teacher presents a question/problem students can answer on tablet and send the response to teacher
    b. Responses can be viewed by teacher and are saved under the students profile
    c. Students can ask the teacher questions through their tablet

E. Teachers can monitor students' screens with a view feature
    a. Teachers will have access to students' tablet screens when students have their attendance on. This feature will ensure that teachers are able to make sure the students are actually working on school instead of being distracted. It also ensures that the students know they are being monitored
F. Calendar / scheduler
    a. Teachers can plan their daily, weekly and monthly activities as well as schedule assessments and events.
    b. Teacher can choose what is viewable on the students calendars
G. Students and the teacher can communicate with each other with discussion board
    a. Students and the teacher can ask and respond to questions at any time.
    b. This can be done through voice or direct message
H. Students can view their grades and can attempt quizzes and tests
    a. Students can see their quizzes and marks, as well as unattempted quizzes

III. Heuristic Evaluation, Process, and Findings

For the heuristic evaluation process the three evaluators individually tested the Hi-Fi prototype intensively, testing each component and filling in the 10 rule of thumb templates according to their findings. The reviewers from here each looked at the three evaluators reports and conducted a classification of the prototype problem severity. Together the evaluators looked at the reviewers classification and decided which problems would get fixed according to the severity of the problem as well as the time constraint of the project. Once the initial evaluation of the prototype was completed, the reviewers separately graded the severity levels of the issues that were found by the evaluators. The review process consisted of grading the issues into a severity spectrum starting from non-issues (0) to catastrophic issues (4). Once the reviewers separately graded the issues, the reviewers re-grouped to discuss their findings and came to agreements on what the true severity ratings of the issues were.

Some findings that were found during the evaluation were mostly inconsistencies between design of the prototypes. For example, some of the icons for buttons that performed the same function were marked differently in the UI which led to confusion on the evaluators' part. Another finding was that some features of the prototypes were missing actions that were discussed in previous stages. For example, for the notebook feature, we had discussed that users should be allowed to add, edit, and remove notes. Although the add and edit features were implemented, the remove feature was forgotten which would lead to catastrophic issues if a user is unable to delete any of the notes in their notebook. This was just one of few high severity issues that were found in the initial prototype.

As for the review process of the heuristic evaluation, we were able to understand which issues were important and which were just minor cosmetic issues or even non-issues. Using the severity scale, we were able to visually see which changes should be fixed first before moving on to later features. The reviewers based their severity ratings on dependency of features, missing actions, and cosmetic issues. The reviewers were able to take a deep dive in the evaluation report and group issues into severity levels that were easier to understand for each member in our group

IV. Reflection

Our heuristic evaluation was a valuable process that we completed. It succeeded in many ways and brought about a much better understanding of the total application and how all of the parts were working together. Conducting the test shed light on consistency issues in our UI, missed features, and outright mistakes that were important to catch. Beyond the details of our checks we were able to implement changes to improve the application and we, as a group, gained a better understanding of the app in general. This broad approach to the subject brought our group together in a way since we had generally been very focused on building individual sections of the prototype. It was nice to work together and gain constructive feedback.

On a more negative side the process was a bit overwhelming. While our app is only a prototype it still possesses a substantial number of features. We also were limited in the scope of our evaluation by the fact that this is a prototype and that not every feature is possible to have in full functionality. For example, it is hard to test the actual typing input or file IO and couldn't really see a feature like spell check at this level. In terms of what we might have done differently in the test; it might have been useful to conduct testing with a bit more structure with more specific workflows with assessed start and end points. Something like this forces us to more directly emulate a real user though it somewhat defies the nature of a simpler 'rule of thumb' heuristic evaluation.

V. Appendix

Evaluation of Prototype

Evaluator 1

Rule of Thumb	Is this rule being applied? How so?	Is this rule violated? How so?	How can this rule further improve usability, utility, and desirability?
1. Visibility of system status	System status is clear. Updates to the state of certain pages are identified with icons. In some cases if something like screen sharing is turned off or if notes are hidden an icon indicates that. Colour coordination and headers also constantly provide information to the user	Generally, no. Though it would be useful to explore the visual input in relation to user studies over time to ensure the clarity of the system status	When at its best this rule can provide constant helpful input for users and dramatically improve user interaction
2. Match between system and the real world	This system emulates a classic whiteboard classroom and draws on classic elements of a classroom from viewing, discussing, or note taking.	No, this is not violated. Changes which do exist are improvements on real world limitations and not the opposite. Enough of a real-world framework exists that this looks good.	This can improve usability, and learning since users can draw upon real world experience to navigate the app
3. User control and freedom	Yes, tools and navigation exist to allow for user freedom and correcting mistakes	Students have limited functions which they can use, but are never trapped or aware that they are missing abilities that are teacher specific	An app is frustrating to use if the user is unable to execute their actions within the framework of what they expect to be possible. Since this draws so heavily on real world classrooms. The app needs to respond like they expect it should

4. Consistency and standards	Sections of the app have their own consistent themes. The app conforms to expected usability in many areas that are somewhat standard. Like notetaking fields with text tools, or a discussion section not unlike many other chat applications	Yes, some navigation icons are inconsistently labelled when returning to the home page. Extra confusing checkmarks exist in Teacher Lessons and Assessments section	This brings familiarity to the user interaction which improves learnability and usability immediately.
5. Error prevention	Simplicity of UI trends toward error mitigation. Sections that are higher stakes ask for confirmation before use (Before taking a test). Other options are generally reversible	Potentially add confirmation for teachers before they make a new calendar item and make it public	Errors in a program directly limit aspects of usability, utility, and desirability
6. Recognition rather than recall	This is being applied. A simple UI is used for teachers and young students. Relevant info for a task is on the same page it is done on. Icons and sections use consistency and images to make recognition of icons and buttons easy without having to learn them	No	This helps users to have simple interaction without needing a lot of memory or attention to understand and utilize the app
7. Flexibility and efficiency of use	Flexibility and efficiency are fairly straightforward in this app. Tools are generally used right on the page they are needed and navigation is quick and doesn't involve a large tree of navigation nodes	Could improve this with extra usability studies. Things like tablet swiping navigation might be great to add	These attributes are important in any app. Without them every aspect of usability suffers

8. Aesthetic and minimalist design	The aesthetic incorporates bright colours, clear imagery, and easily recognizable elements that reinforce a user's understanding	Some areas could be improved for touchscreen use. For example, tests are more easily clicked on than touched. Having multiple input fields for new discussions or calendar items can be tiring to input. Especially with the constant UI adaptation to the intrusive keyboard popping in	These characteristics keep things simple for the user and improve their satisfaction upon interaction with the app
9. Help users recognize, diagnose, and recover from errors	The application of this rule is more behind the scenes and error prevention is not particularly necessary for much of the user workflows	No system is in place for users to contact the app owners to inform them of errors or bugs. It is unclear if a spell check functionality works in the app	Reporting from users empowers better development as internal QA is not always going to get 100% coverage. Spellcheck would improve the day to day use of the app and help people consistently spell properly
10. Help and documentation	No	Similar to error prevention above. Tools to contact support or simply flag errors could be useful	When required this is a good fallback for users who are uncertain of how to use the application. They are empowered by this and better able to complete their tasks independently

Evaluator 2

Rule of Thumb	**Is this rule being applied? How so?**	**Is this rule violated? How so?**	**How can this rule further improve usability, utility, and desirability?**
1. Visibility of system status	Home page says “Hello Billy” to show that the system is logged in,	Tests and quizzes should have a timer to show the amount of	delivered a message when messaging on the

	hourglass on teachers lessons to show the interactive activity is in progress. shows days remaining for deliverables under student grades	time left in the test	discussion board.
2. Match between system and the real world	All elements are considered with the tablet template in mind (scrolling features)	n/a	More swiping elements for going back ect
3. User control and freedom	Creative freedom in notebook section, access to keyboard for asking questions and posting on discussion board	For lessons, when using the marker the only way to close it is to press the icon again. Can't delete notes you have created or edit titles	In lessons when using markers if a student touches anywhere else it should close or automatically close. Add edit button in notebook
4. Consistency and standards	Use of consistent back arrows and banner headings. Also color coordination used for specific sections	Home button on lessons is different from other home buttons	Make the icons consistent across product
5. Error prevention	“are you sure” disclaimer on students tests and quizzes,	no login error prevention. No error prevention on assignment submission	Add error prevention for login and assignment submission
6. Recognition rather than recall	Intuitive scrolling under calendar, use of familiar icons (back arrows), color profiling to recognize which section they are in at a glance	n/a	add more scrolling/swiping actions for ipad
7. Flexibility and efficiency of use	Under teacher present can hide screen while doing other tasks, Notebook has header for colors, text ect efficient so students don't have to navigate to get customize options		have a teachio logo on main pages that redirect to home page

8. Aesthetic and minimalist design	Use of large buttons and simple font, Minimal black icons, Color coordination for	Entering tests and quizzes could be more aesthetic right now it mostly just text	Make tests and quizzes have more color and icons.
9. Help users recognize, diagnose, and recover from errors	When a student attempts to access a quiz that is already written it shows a message that the student can no longer access this.		
10. Help and documentation	Before a student writes a test or quiz the rules of the test are documented and the time allowed is mentioned		Add more help to the home page with link to help email or troubleshooting document

Evaluator 3

Rule of Thumb	**Is this rule being applied? How so?**	**Is this rule violated? How so?**	**How can this rule further improve usability, utility, and desirability?**
1. Visibility of system status	i. Yes, many areas the user is constantly communicated in what the system state is currently in ii. The information is given to them instantly after clicking on a button. iii. Indicators showing what the current selection/screen is	In Some areas it is difficult to tell which of the icons are available to be clicked, the user can get confused on what the current status of the page is. For instance, on the lecture screen some icons are white but can't be clicked. Possibly change the color to grey to indicate the icons are locked.	i. This rule will help make the system more predictable for the user, the system constantly informing the user about the result of their action will make the system easier to use and the user will feel more confident and trusting with taking actions.
2. Match between system and the real world	i. Yes, the system mirrors a lot of previous programs like d2l, onenote, smart learning suite, while also using icons the users might	i. I didn't come across any violations of this rule	i. Keep concepts familiar and language simple will make sure the user can easily understand what is going on. We have to make sure

	have seen in other areas of their daily life that they might already be familiar with, as well as using simple language. This would reduce cognitive strain as the users are already familiar with aspects of the system.		we don't assume that the user will know what something means, we have to keep it as simple as possible. The best way to do this is to use the user's language which is the real-world conventions. Which in our case would be revolving around the "Education" system?
3. User control and freedom	i. Majority of functions had a well labeled back or home button. or the ability to click on the button again to close it.	i. In my testing I didn't find any areas where I felt "stuck" and couldn't return back to the previous page	i. This rule will improve usability as it gives the user more confidence with the software as well as freedom to navigate through it as they need. The user being confident with the software will also make the software more desirable to the user.
4. Consistency and standards	i. Yes, labels were mostly consistent across multiple areas. Icons followed other popular software icons to keep global conventions consistent.	i. Some screens are using home button, while others using back to home arrow, On lecture screen some boxes weren't consistent across different pages, Some screens don't have the ipad task bar on the top, Colors changing within some pages, better to keep them consistent, Icons on the lecture screen for pen/eraser differ then ones on notes screen.	i. Meeting user expectations as well as consistency across industry conventions can help increase their enjoyment and experience of using the software.

5. Error prevention	i. A lot of pages have back buttons and only one option for the user thus minimizing the chance of errors. ii. On quiz pages trying to click a submitted quiz will let you know you have already completed this quiz	i. On the lecture screen the user might end up with a lot of clutter as well as the user not knowing if something is clickable or not. Greying out these options will help.	i. Keeping the software fluid and reducing the burden on the user by making the software easy to use and forgiving of mistakes is a key part of user experience.
6. Recognition rather than recall	i. Keeping consistent icons helps the user recall what a button would do ii. Users aren't tested on their ability to remember the software, everything has well labeled buttons and icons to help them recall information.	no	i. This helps reduce the amount of information the users need to remember which will improve usability as well as better the user experience.
7. Flexibility and efficiency of use	i. Some customizable features are available for the user like the discussions page	no	i. This allows for more advanced users to be able to speed up their tasks within the software, thus making it more desirable for them to continue to use the software.
8. Aesthetic and minimalist design	i. Yes, Majority of the pages focus on the necessary components thus reducing clutter.	i. limiting the number of screens, the user can open in the lecture screen helps reduce clutter	i. This rule helps reduce the amount of distractions the user might run into if too much information is displayed on a screen. Focusing on the important task will increase the user experience and make the program more usable.

9. Help users recognize, diagnose, and recover from errors	i. Some screens will display a message telling you already have completed this task like the quizzes screen	i. Users can't click on some parts of the lecture screen, adding a grey out to those selections will help the user know that they can't choose that.	i. This rule helps the user maneuver around the software while being told effectively if something they have done lead to an error in words rather than error codes.
10. Help and documentation	i. No it isn't		i. If the user needs help with the software to complete an action, having documentation or a place to easily learn how to complete that action will increase the user experience.

Review of Evaluation

Problems	Rating 1	Rating 2	Combined Rating
In some areas it is difficult to tell which of the icons are available to be clicked, the user can get confused on what the current status of the page is. For instance, on the lecture screen some icons are white but can't be clicked. Possibly change the color to grey to indicate the icons are locked.	2	2	2
Some screens are using home button, while others using back to home arrow, On lecture screen some boxes weren't consistent across different pages, Some screens don't have the ipad task bar on the	1	3	2

top, Colors changing within some pages, better to keep them consistent, Icons on the lecture screen for pen/eraser differ then ones on notes screen.			
On the lecture screen the user might end up with a lot of clutter as well as the user not knowing if something is clickable or not. Greying out these options will help.	4	2	3
Limiting the number of screens, the user can open in the lecture screen helps reduce clutter	2	2	
Users can't click on some parts of the lecture screen, adding a grey out to those selections will help the user know that they can't choose that.	1	1	1
Tests and quizzes should have a timer to show the amount of time left in the test	1	2	1
For lessons, when using the marker the only way to close it is to press the icon again. Can't delete notes you have created or edit titles	4	3	4
no login error prevention. No error prevention on assignment submission	4	2	3
Entering tests and quizzes could be more aesthetic right now it mostly just text	1	0	1

Students have limited functions which they can use, but are never trapped or aware that they are missing abilities that are teacher specific	0	0	0
Yes, some navigation icons are inconsistently labelled	2	4	3
Potentially add confirmation for teachers before they make a new calendar item and make it public	1	2	1

Heuristic Evaluation Report

Our application, *Techio,* deals with many features that we wish to bring to our users. With the amount of the features that we have, we want to ensure that our users are not bombarded with what we are offering them and allowing our application to be able to cater to whichever needs they may have. In order to ensure that our product has a simple and user-friendly design, we conducted a Heuristic Evaluation using our team members and separating into different roles for the process During our Heuristic Evaluation process, we divided our team up into *Evaluators*, who were responsible for going through the design prototype and recognizing issues within the prototype that need to be looked, and *Reviewers*, who investigated the evaluation reports and categorized the issues into different severity levels. We found that using this process allowed us to understand deeper problematic issues in our design flow of our project. Understanding these issues allowed us to change our design in various ways, whether it was simplifying the design or adding features that were missing in the first place. Categorizing the issues into various severity levels allowed for the group members to understand which changes were more important to implement than others, especially if the issues overlapped.

During the evaluation process of the Heuristic Evaluation, the evaluators went through every feature in our prototype and tested all the sub-features that that feature offered. During this process, the evaluators made sure to make any note of something that was missing, improper design, inconsistency, etc. They then used the *Jakob Nielsen User Interface Guidelines* to further describe the issues they found and the possible solutions to those issues. Some of these issues included missing functionality that was discussed in previous stages as well as this stage of the project. For example, during the first iteration of the Notebook feature, the ability

to delete or edit a note was not captured in the prototype, which then led to confusion for the other members of the project. One of the other important issues that was found during the evaluation process was some inconsistency with icons and buttons. Some screens had buttons that did the same thing but looked different which would cause confusion to users using the app as well as also lead to an inconsistent UI design. Using the guidelines provided by Jakob Neilson allowed us to not only discover various issues throughout our project but also come up with some solutions as to how to fix those issues.

As for the reviewers, they were responsible for categorizing the issues that the evaluators found into different severity levels. The severity levels that were used ranged from insignificant issues (0) all the way to a usability catastrophe (4). The reviewers rated the issues based on this scale individually, which allowed our group to understand which issues are more important to resolve and which we should ignore. Once each of the reviewers finished grouping the issues into different severity levels, the reviewers re-grouped and talked about some of the similarities and differences they had in their results. Doing this allowed for the rating of issues to be agreed upon within the reviewers which in turn allowed for more confident results. The review process allowed for a timely and ordered fashion in changing up the design of our application in terms of severity. Next the evaluators regrouped and discussed their findings and cross checked it with the reviewer's severity rating and started to decide on which problems would be fixed. We began by changing up the designs of the issues marked with a severity level of 4 and once those were finished, we moved forward down the ladder.

Some of the issues that faced higher severity level (3-4) included the following

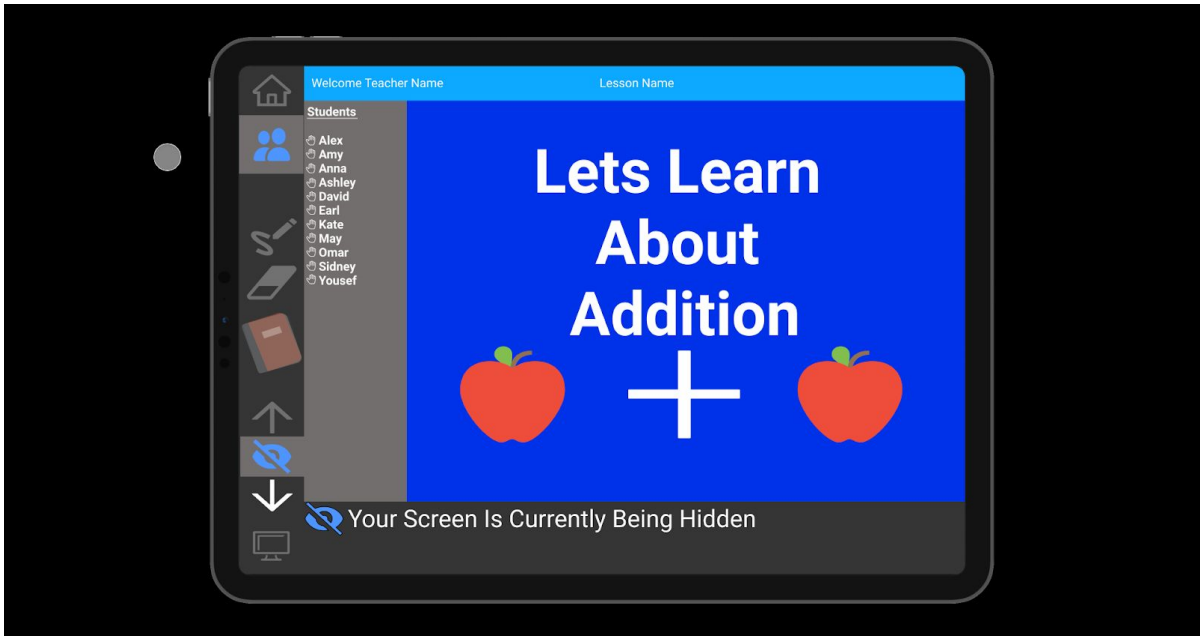
- Some navigation icons are inconsistently labelled
- Can't delete notes you have created or edit titles
- Some screens are using home button, while others using back to home arrow
- Colors changing within some pages, better to keep them consistent
- For lessons, when using the marker, the only way to close it is to press the icon again

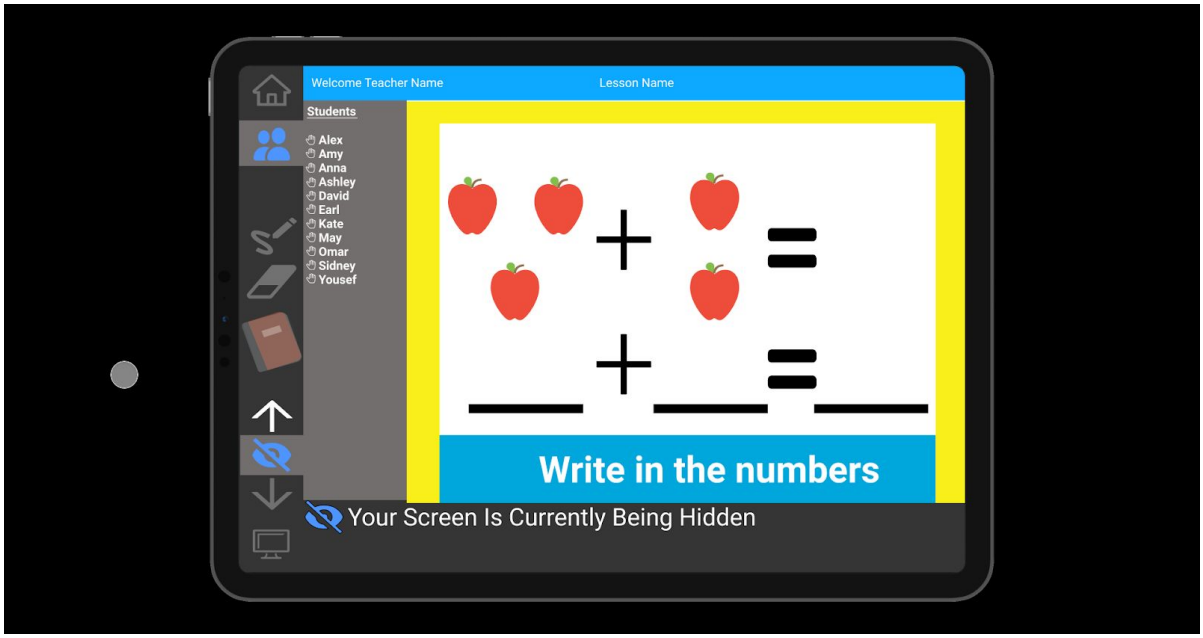
Some of the lower severity level (0-2) issues included the following

- Limiting the number of screens, the user can open in the lecture screen helps reduce clutter
- Some inconsistency with icon position and bar position on lecture screen.
- Some screens don’t have the iPad task bar on the top
- Users can't click on some parts of the lecture screen, adding a grey out to those selections will help the user know that they can't choose that option
- Potentially add confirmation for teachers before they make a new calendar item and make it public

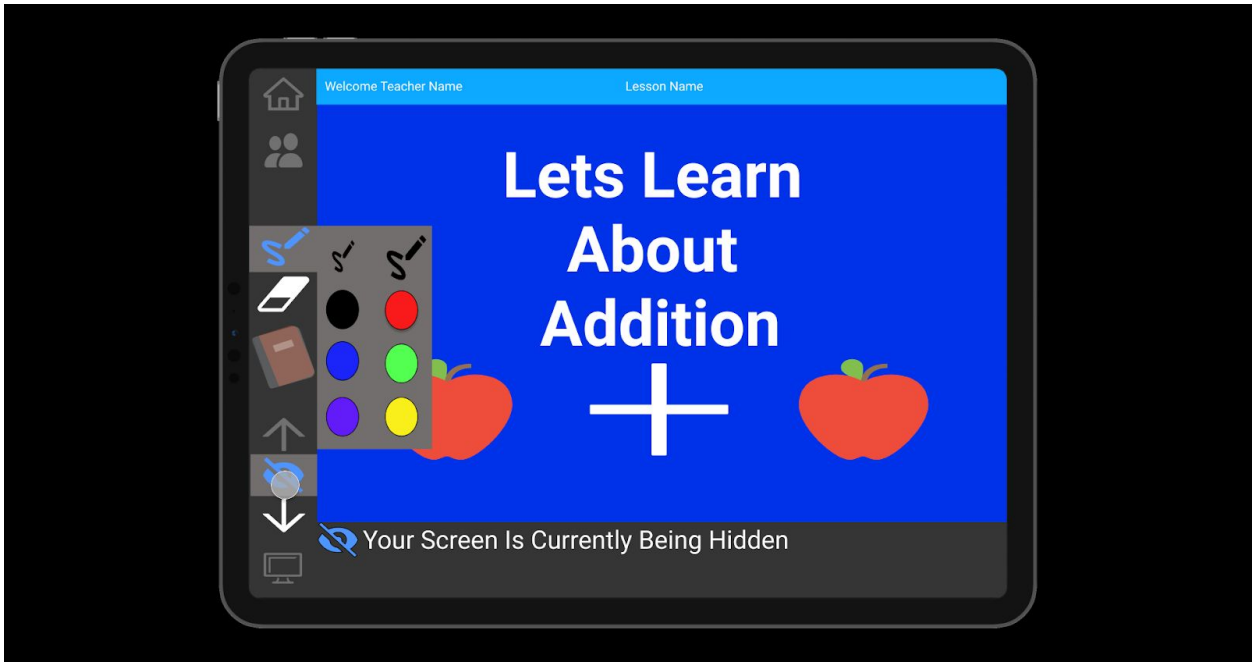
Following the actions of the reviewers we were able to confidently make the final changes to our prototype preparing for the demo. This process was very insightful in identifying issues in design elements and viewing the product through a critical lens as a potential user of the product. This also added new sets of eyes to different areas of the application. While we each developed sections of the prototype we hadn't spent as much time testing each other's work. This brought about an ability for each of the evaluators to assess the project more as a functioning whole instead of a module. Working through the heuristic evaluation forced us, as a group, to spend time with the application and to put ourselves in the mindset of an actual user. Furthermore, testing the app showed us that there were some inconsistencies between parts. In these ways the heuristic evaluation was invaluable in providing a measure of our program and its usability.

Some consistency fixes,

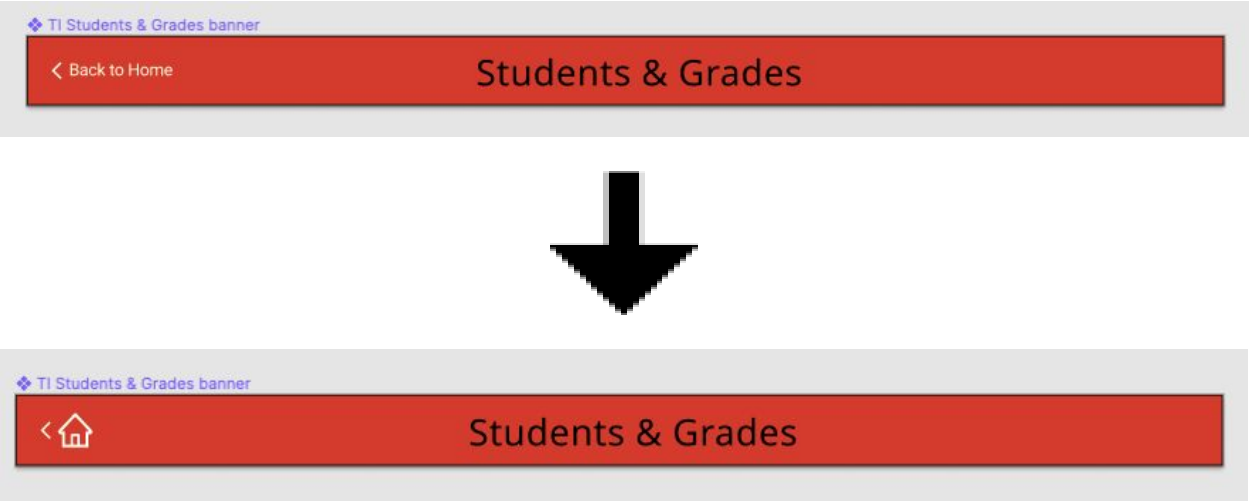

Welcome Teacher Name
Lesson Name
Students
Alex
Amy
Anna
Ashley
David
Earl
Kate
May
Omar
Sidney
Yousef
Lets Learn About Addition
Your Screen Is Currently Being Hidden


Welcome Teacher Name
Lesson Name
Students
Alex
Amy
Anna
Ashley
David
Earl
Kate
May
Omar
Sidney
Yousef
Write in the numbers
Your Screen Is Currently Being Hidden

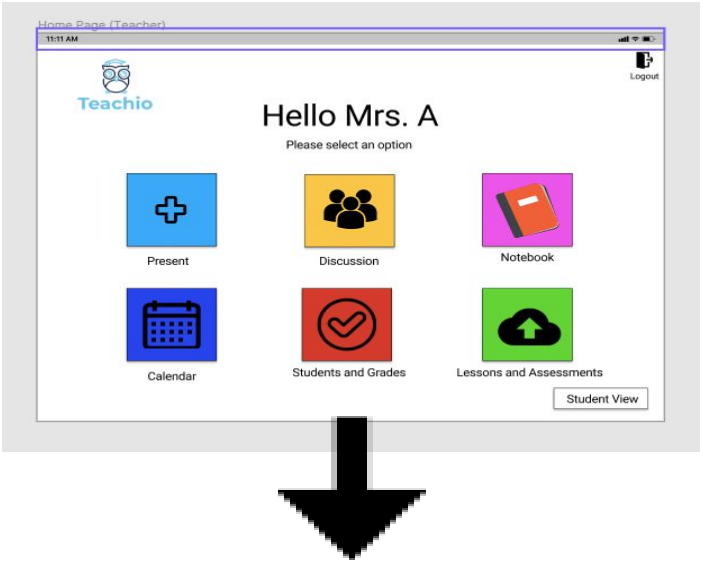

Welcome Teacher Name
Lesson Name
Lets Learn
About
Addition

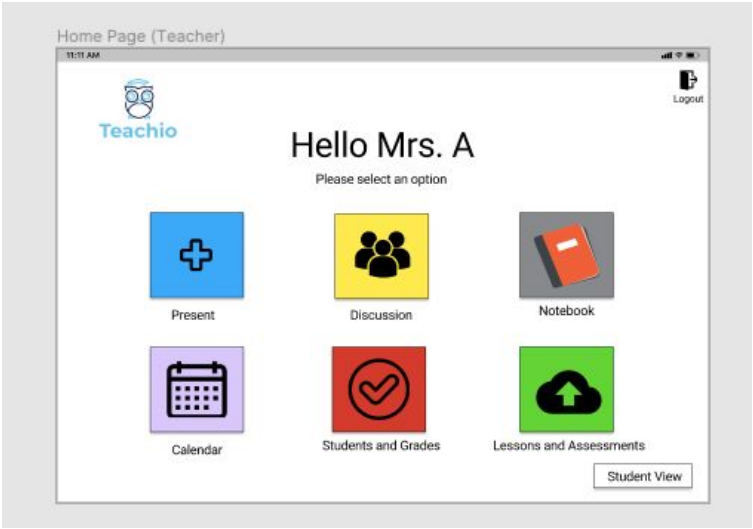

Welcome Teacher Name
Lesson Name
Lets Learn
About
Addition
Your Screen Is Currently Being Hidden

Headers have the same back navigation and colour coordination is consistent to feature.



Changed tab colours.





Changed the Student interface, calendar->add event functionality to have less options and control. This is done for simplicity and higher learnability.