



Design Document
2018

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Motify

General Design Document

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1.0 Project Overview

1.1 Project Description

A personalized visual calendar that is intended to help autistic college/ university students organize their daily life and develop interpersonal skills.

1.2 Target Audience

The target demographic of this app is **college/ university students** who are diagnosed with **autism spectrum disorder**. In addition, ASD facilitators will use this app as a tool to help autistic students with their studies and personal development.

1.3 Project Objective

The three design pillars of the Motify project include:

- Allow a user to **stay organized**
- Allow a user to **build a network**
- Allow a user to **practice social skills**

1.4 Target Platform

- Personal computers and laptops
- Tablets and phones

2.0 Core Features and Mechanics

2.1 Initialization: Choosing Pet

During initialization of the app, the user is brought a window where they can pick a pet. The second window allows the user to name the pet and finally, a congratulatory screen presents the user with the pet they have chosen.

2.2 Calendar

The calendar will consist of an **auto-generated visual schedule** that will organize school and home related tasks (i.e. studying for an exam). In addition, relevant information such as time, description of the task, and an accompanying visual will be provided on the calendar. The calendar is primarily viewed on a linear daily timeline. In addition, the monthly view's purpose is for allowing the user to view their schedule months in advance, without scrolling through the daily timeline.

2.3 Virtual Pet Avatar

A virtual pet (i.e. a frog, bunny, kangaroo) is selected by the user in the initialization phase of the calendar app. As a user completes tasks and challenges, they gain skill points that can be used to buy customizations for their pet such as accessories, emotes, etc.

2.4 Pet Room: Shop and Inventory

This window is separated into two sections: the shop and inventory. In the shop, the user is able to purchase outfits for the pet, using skill points. In addition, the shop can be sorted based on the users preference, the three sorting categories include: alphabetical, price(high to low), price (low to high). The inventory is where the users purchases are visible, it allows you to equip purchased items onto the pet.

2.5 Chat Room and Messaging

The chat room feature will allow ASD students to **connect with their success team** (i.e. parents, learning strategist, professors, etc). This feature would utilize designs from successful messaging apps such as [Slack](#) and [Messenger](#).

2.6 Skills and Badges

This window displays the various accomplishments that a user has attained while utilizing the Motify App. The **skills window** highlights the communication skill points that the user has earned for various categories: visual, verbal, written, and social interaction. The **badges window** are display long term goals for the user. They are achieved while doing various things within the app (i.e. obtaining a badge for completing 3 tasks).

2.7 Challenges

Optional challenges will be spread throughout the visual schedule. In addition, each challenge allows the user to take part in **30 second to 1 minute long mini-games that teach essential social skills**. Once a challenge is completed, the user will receive social communication experience points for a particular skill category (i.e. verbal communication + 30) and they will also receive skill points (the general currency of the app).

2.8 Courses (Grade Reports)

This feature allows ASD students to see grade reports in an organized way. Using systems and tools similar to [Khan Academy](#) and [Tenmarks Amazon](#).

3.0 User Interface

3.1 Menu and UI Components

3.1.1 Initialization : Choosing a Pet

- Choosing Pet
 - Scrollable selection of animated pets
- Choosing Pet Name
 - Interactable text field
- Congratulatory Screen
 - Displays pet chosen and name

3.1.2 Navigation Bar

- Accessed by clicking the top left corner UI icon.
- List of icons and buttons to navigate to other windows

3.1.3 Calendar

- Daily Task
 - Image / radial progress bar
 - Time (i.e. 10:00 a.m. to 10:15 a.m.)
 - Short description (i.e. bus ride)
- Challenge
 - Custom mini-game

3.1.4 Pet Room

- Animated virtual pet
- Buttons
 - Shop UI Panel
 - Inventory Panel

3.1.5 Messages (Chat Room)

- Circular icons for recent contacts (i.e. parents, psychologists, etc.)
- Messaging window

3.1.6 Goals/Skills

- Badges (long term goals)
- Social communication skills graph (represented by horizontal coloured bars)

3.1.7 Courses (Grade Reports)

- Each school course will be organized into a card
 - Header
 - Name of Course
 - Course Code
 - Coloured Average and Goal Percentage in Class
 - Body
 - Course Report (i.e display latest test and assignment scores)

4.0 Ideal User Experience

- Provide a structured and organized environment to do daily tasks
- Access information easily (i.e. grades, tasks completed, etc)
- Create challenges that teach the user essential social skills
- Clear sense of visual progression (i.e. badges, skill graphs, etc)
- Allow customization and personalization for users through a virtual pet

5.0 Art Direction



(Left: [Children with Autism: A Visual Schedule](#), Right: [Tamagotchi](#))

The artstyle will consist of using flat colours and simple shapes to differentiate interactable elements within the app. In addition, a cute aesthetic will be applied to the pets within the app to encompass a broad audience appeal.

5.1 Accessibility Considerations

A [study](#) on colour preference for autistic individuals concluded that **sensory overloading colours such as yellow, pink and red should be avoided**. In addition, colors such as blues, greens and browns are proven to be more effective in reducing anxiety and stress among individuals with ASD.



6.0 References

A compiled list of references involving ASD and technology used to treat and help individuals under the spectrum can be found [here](#).

Motify Calendar

Technical Design Document



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1.0 App Screens

A breakdown of screens to be implemented within the application.

1.1 Initialization - Choosing Pet

1.1.1 Intention

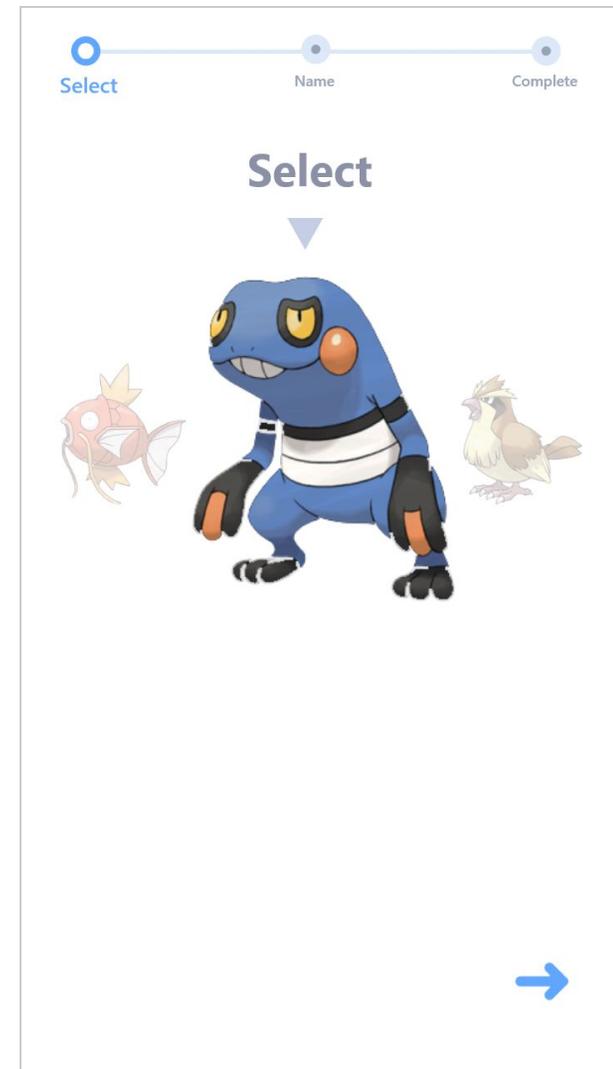
This window allows a user to select a pet.

1.1.2 Functionality

- Scroll
 - The player is able to scroll through the different pet types by swiping
- [Uses [Arrow Button](#)]
- [Uses [Notched Progress Bar](#)]

1.1.3 Critical Components

- Pet
 - Three pets
 - Frog
 - Bunny
 - Kangaroo



1.2 Initialization - Picking Unique Name

1.2.1 Intention

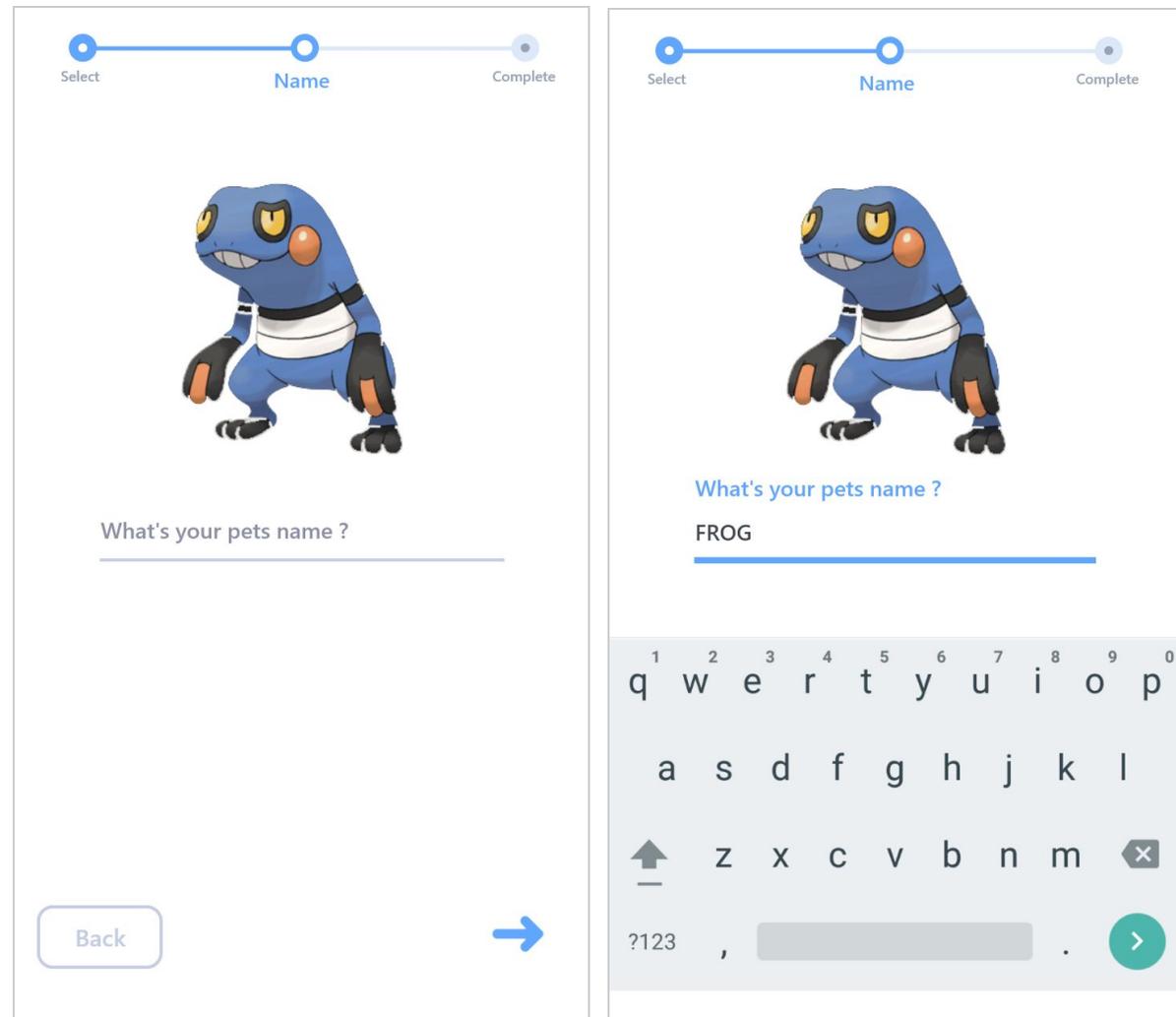
This initialization window allows the user to select a name for the pet.

1.2.2 Functionality

- Arrow Button
 - Progresses user to the next page
- [Uses [Text Input Field](#)]
- [Uses [Back Button](#)]
- [Uses [Notched Progress Bar](#)]

1.2.3 Critical Components

- Text Field Rectangle
- Animated Pet Image



1.3 Initialization - Finalizing Choice

1.3.1 Intention

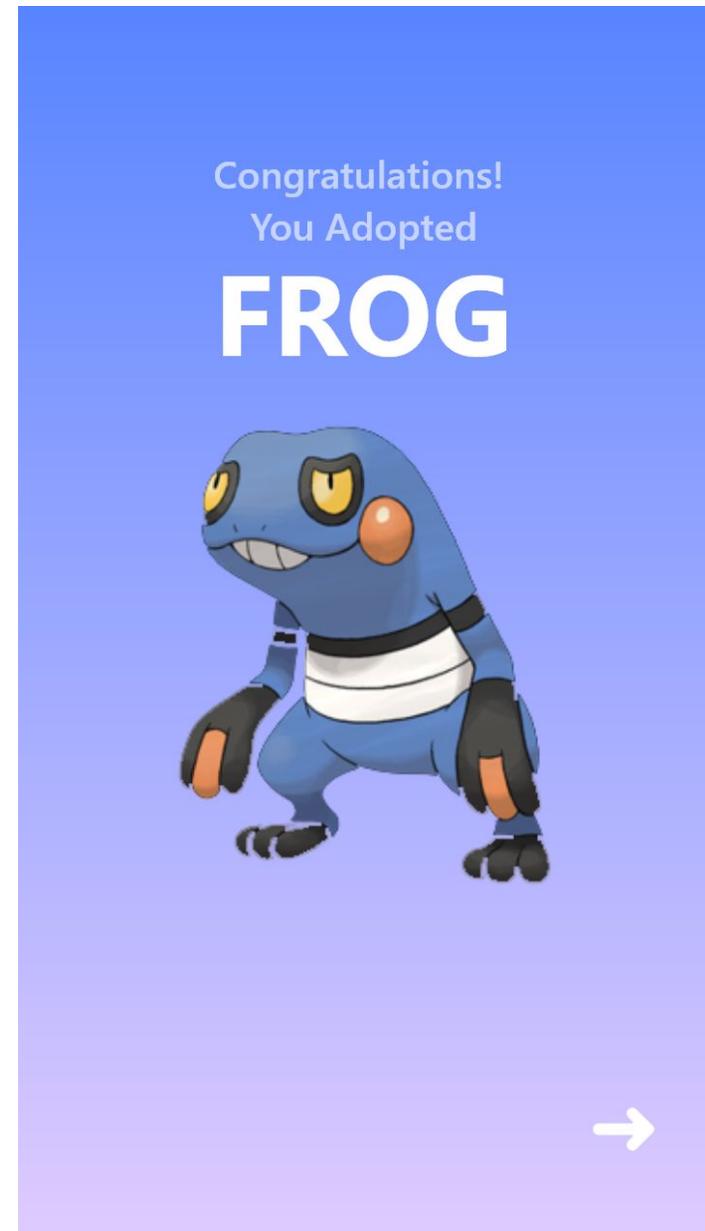
This window showcases to the user what pet they have picked and what name they gave it.

1.3.2 Functionality

- Confetti falling down (Particle System)
- [Uses [Arrow Button](#)]

1.3.3 Critical Components

- Animated Pet Image



1.4 Check-In Screen - Log-In Streak

1.4.1 Intention

The screen opens up once every 24 hours, to give the user a chance to win a daily reward of skill points. This feature promotes the user to open up the app on a daily basis and increase retention.

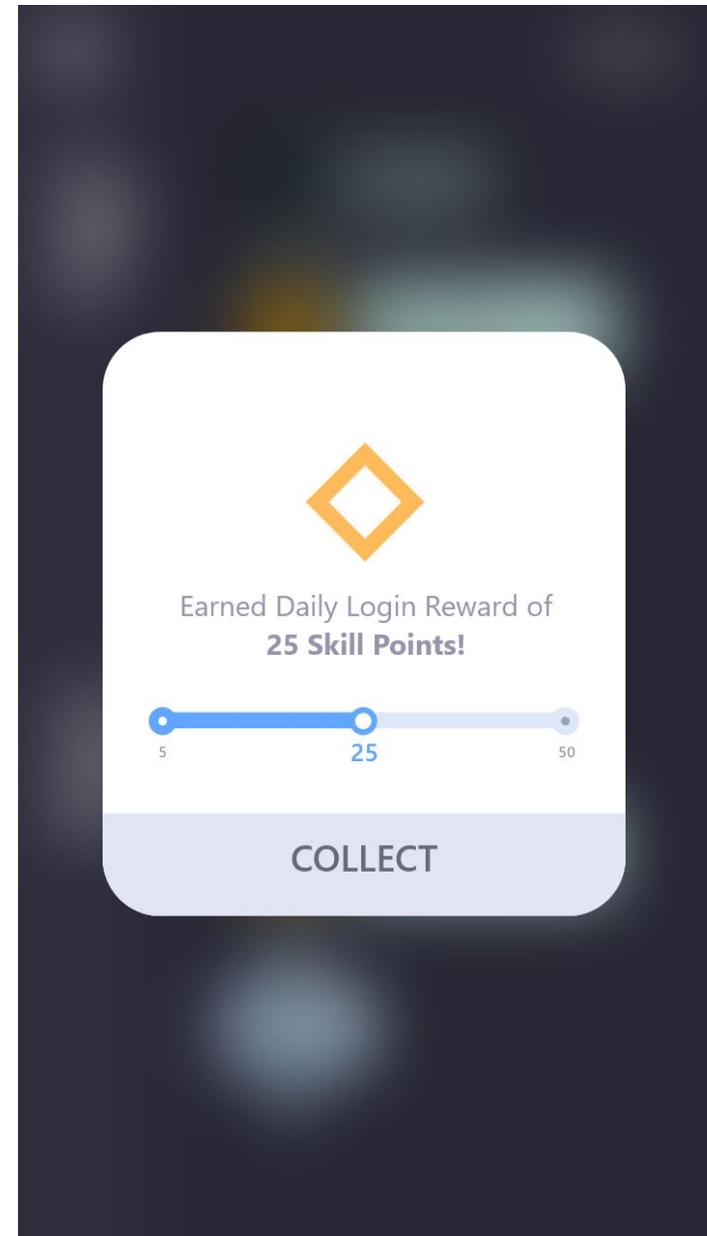
The skill points awarded double everyday, and reset each week back to the original amount.

1.4.2 Functionality

- [Uses [Notification](#)]
- Log in Streak
 - [[Uses Notched Progress Bar](#)]

1.4.3 Critical Components

- None



1.5 Calendar - Daily View

1.5.1 Intention

The user will be able to view their daily schedule in this window and also participate in challenges that are integrated into the calendar. If a user clicks the challenge button in the calendar window, a random challenge will be selected.

1.5.2 Functionality

- [Uses [Navigation Button](#)]
- [Uses [Skill Point Counter](#)]
- [Uses [Toggle](#)] - Switch modes between daily and monthly view
- Challenge Node
 - User peels the open button
 - Transitions into random mini-game
- Each Event Node contains
 - Radial Bar (showing progression of a task)
 - Image
 - Name of task
 - Start and end time
- Cycle through nodes (of events) when a task is completed
- Create Event Button

1.5.3 Critical Components

- Event Template
 - Radial Bar
 - Vertical Rectangle Shape
- Challenge Icon



1.6 Calendar - Monthly View

1.6.1 Intention

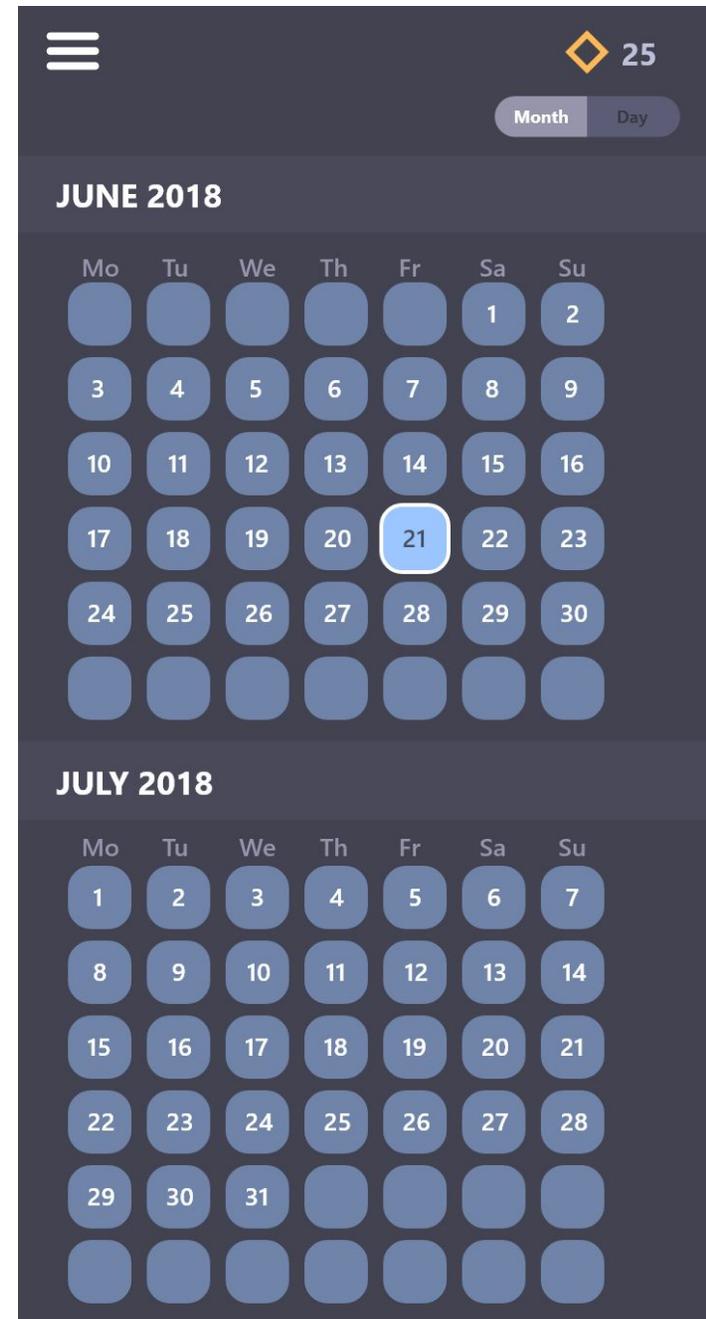
This view allows the user to quickly navigate to other days of their calendar. If a date on the monthly view is clicked, the screen transitions to the [Daily View](#), and the timeline gets adjusted as well.

1.6.2 Functionality

- [Uses [Navigation Button](#)]
- [Uses [Skill Point Counter](#)]
- [Uses [Toggle](#)]
 - Switch modes between daily and monthly view
- Interaction
 - Clicking on a day with bring the user to the daily view and show what is scheduled that day
- Scroll
 - User can scroll up and down to view upcoming or previous months

1.6.3 Critical Components

- Toggle Button



1.7 Calendar - Daily View - Removing Existing Event

1.7.1 Intention

When the user holds down on a event node for a second, it is now in an editable state. It starts shaking, which indicates to the user that they can interact with it. The user is able to delete the node, with a red button that appears on the right hand side

1.7.2 Functionality

- Delete Event Button
 - If pressed, it brings up a [Remove Event Notification](#)

1.7.3 Critical Components

- Delete Icon



1.8 Calendar - Daily View - Moving Event (Existing or New)

1.8.1 Intention

In general, when moving an event, the layout of the daily view calendar gets changed. Small notches are added to the timeline, they indicate to the user what spots an event can and cannot be dragged to.

There are time slots written between events, indicating to the user how much time is available. If there is an x on the timeline, it means that an event can't be dragged there because there is no time available.

Existing Event: If the user holds down on a event node for a second, it starts shaking and its allowed to be moved across the timeline.

New Event: When the create button is held and dragged from its original position, a new event node is created that follows the users touch position on the screen.

1.8.2 Functionality

- Event Node moves according to users position on screen
- Small nodes appear in between events
 - Display if a node can be moved to that point
 - Indicate time availability

1.8.3 Critical Components

- None



1.9 Calendar - Creating Event (User Interaction: Tap)

1.9.1 Intention

If the create button on the calendar is tapped by the user, a new event window appears. In this window, the user is able to manually input a name, set the date and image for the event.

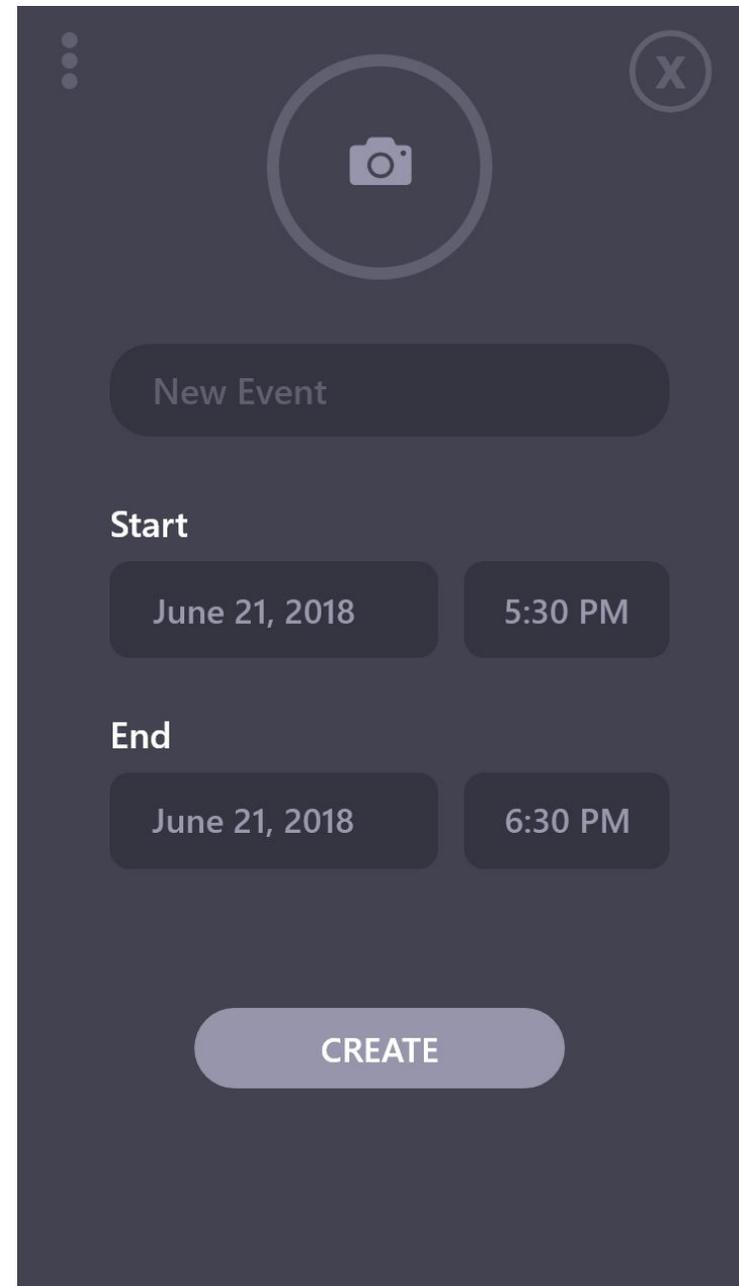
For more customizability, an additional options button is added, where the user can set if the newly created event is repeating, location tags, etc.

1.9.2 Functionality

- Cancel Button
- Create Button
- Camera Icon
 - If the user presses the empty circular window, it brings up the [Selecting Image Window](#)
- 2 Input Field Categories
 - Start
 - Date and Time
 - End
 - Date and Time
- Additional Options Button

1.9.3 Critical Components

- None



1.10 Calendar - Creating Event (User Interaction: Tap) - Input Data Popup

1.10.1 Intention

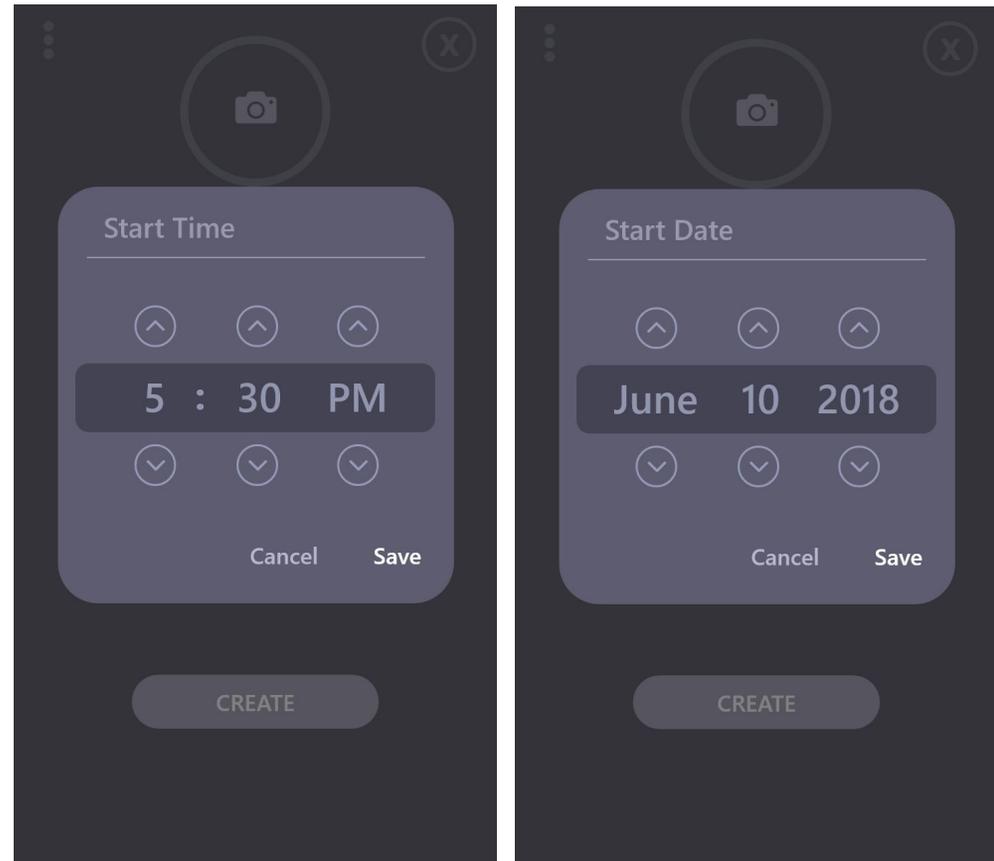
If one of the input fields for the time and date are selected in the [create event window](#), a popup will appear that will allow the user to edit the pre-existing values.

Two Types of Popups:

- Edit Date
- Edit Time

1.10.2 Functionality

- Header
 - Describes what type of popup (i.e. Start Time)
- [Uses [Cancel Button](#)]
- Save Button
- If Date Popup
 - 3 Slider Buttons
 - Month, Day, Year
- If Time Popup
 - 3 Slider Buttons
 - Hour, Minute, AM/PM



1.10.3 Critical Components

- None

1.11 Calendar - Creating Event (User Interaction: Long Hold and Drag) - Setting Up Time

1.11.1 Intention

This window appears once the newly created event node is on a notch within the timeline. It allows the user to pick a name, image, and time frame for the newly created event.

For example,

- *Eat Lunch 4:00 PM - 5:00 PM*

-
- ***New Event (1 hour available)***
-

- *Go for a Run 6:00 - 7:00 PM*

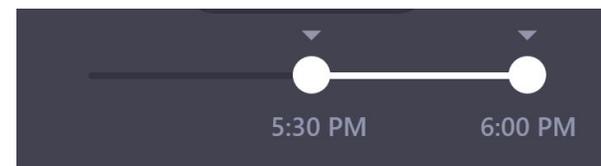
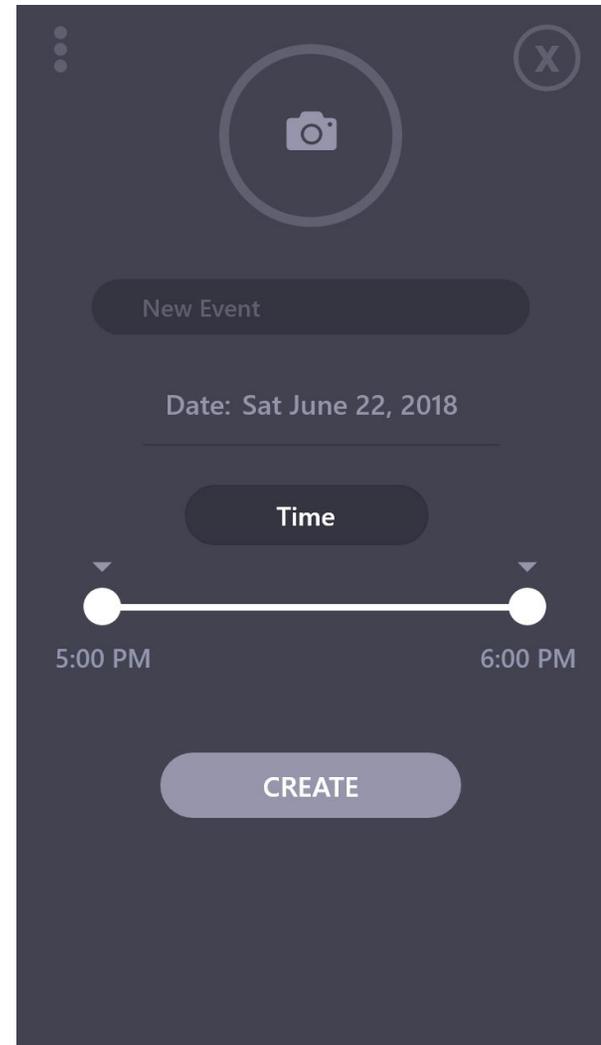
In this example, the user has 1 hour in between “Eat Lunch” and “Go for a Run” to fit in a new event. To adjust the time frame, there is a slider with two interactable handles. At the edges, the constraints of time are listed (5:00 PM - 6:00PM). The user is able to move the two handle points to decrease the time frame to their choosing.

1.11.2 Functionality

- Create and Cancel Button
- Interactable Slider (Two Moveable Handles)
- [Uses [Text Input Field](#)]

1.11.3 Critical Components

- None



1.12 Calendar - Creating Event - Selecting Image

1.12.1 Intention

This window is opened if the user click the empty camera icon. The user is able to add a custom image to the custom event they are trying to create.

Options for Custom Picture:

- Take a Picture
- Gallery

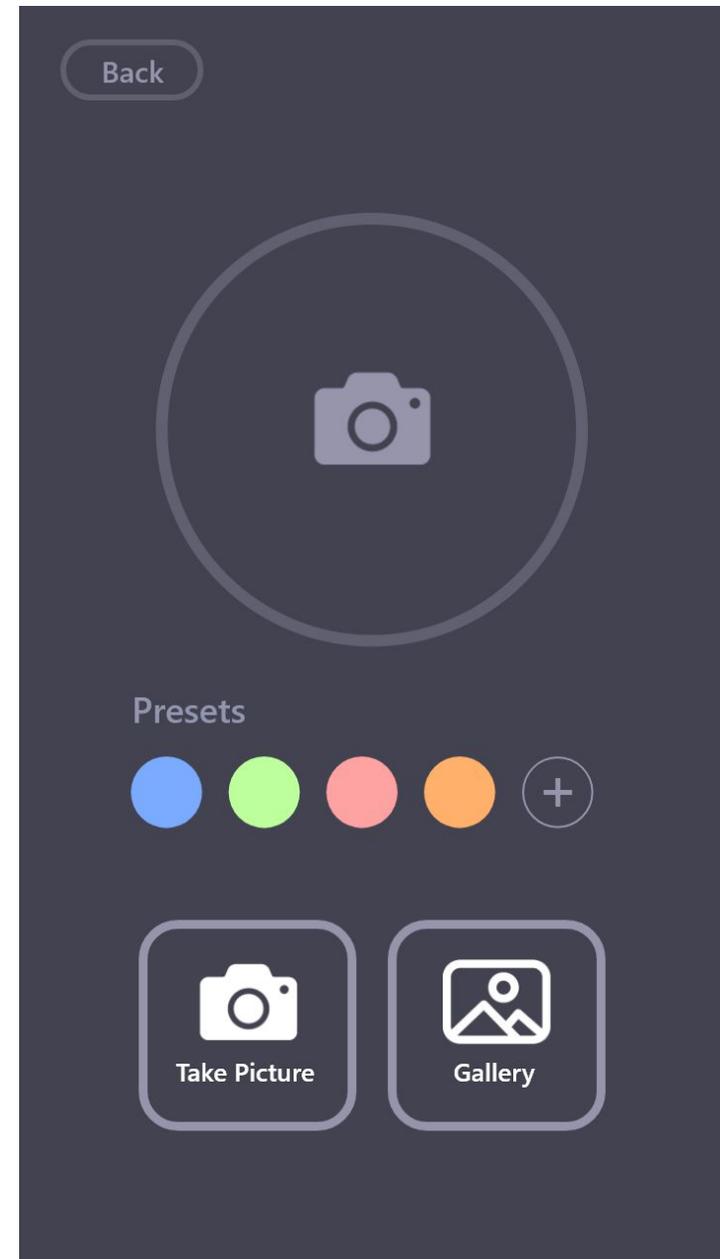
The user is able to set preset color or images, if they don't want to take a picture. They can also add images from their gallery and make them into presets (i.e. lunch image).

1.12.2 Functionality

- [Uses [Back Button](#)]
- Take a Picture Button
 - Needs access to the phones camera
- Gallery Button
 - Needs access to the phones image gallery

1.12.3 Critical Components

- None



1.13 Navigation Bar

1.13.1 Intention

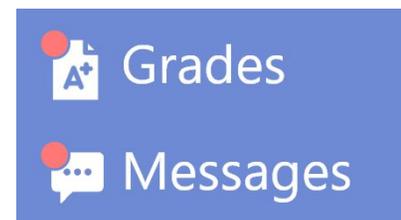
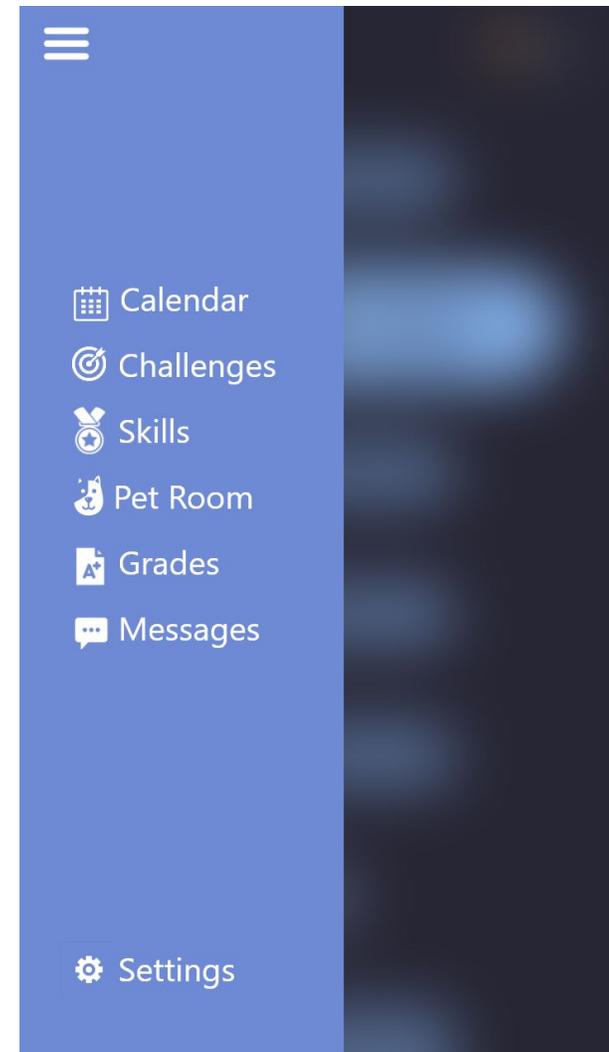
Allows the user to navigate to important screens (i.e. calendar, grade reports, pet room, etc) from one location.

1.13.2 Functionality

- Clicking the (three dash icon) brings up the navigation bar from the left
- Embedded notifications in the navigation bar
 - Red Circle (Unread) overlaid on icon
 - Pulsing animation
 - No Circle (No Notifications)
- [Uses [Navigation Button](#)]
 - Pressing it again while the navigation bar is open, closes the window

1.13.3 Critical Components

- Translucent Glossy Panel
- Vertical Bar
- Custom Icon
 - Calendar
 - Challenges
 - Skills
 - Pet Room
 - Grades
 - Messages
 - Settings



1.14 Messaging

1.14.1 Intention

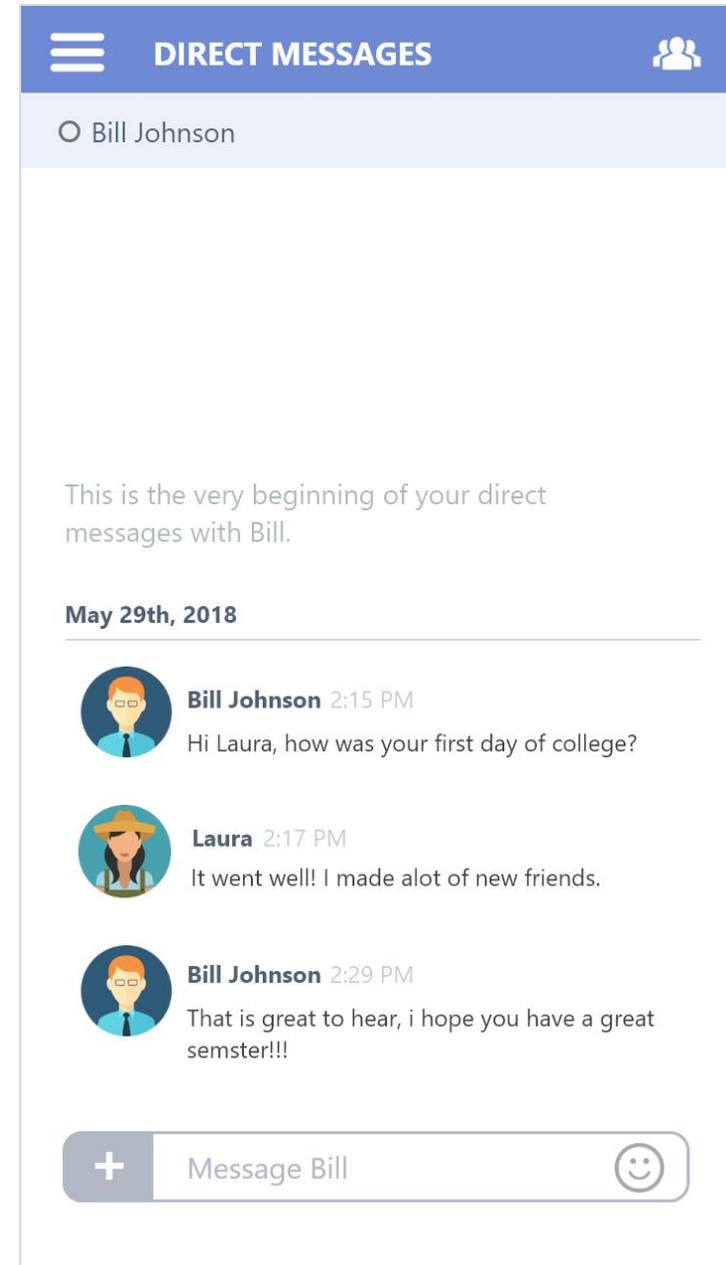
This window displays the users contacts (i.e. ASD facilitator, Learning Strategist) and chatrooms

1.14.2 Functionality

- [Uses [Navigation Button](#)]
- Networking

1.14.3 Critical Components

- Icons
- Horizontal message window
- Button
 - Plus
 - Emoji Icon



1.15 Messaging - Contacts

1.15.1 Intention

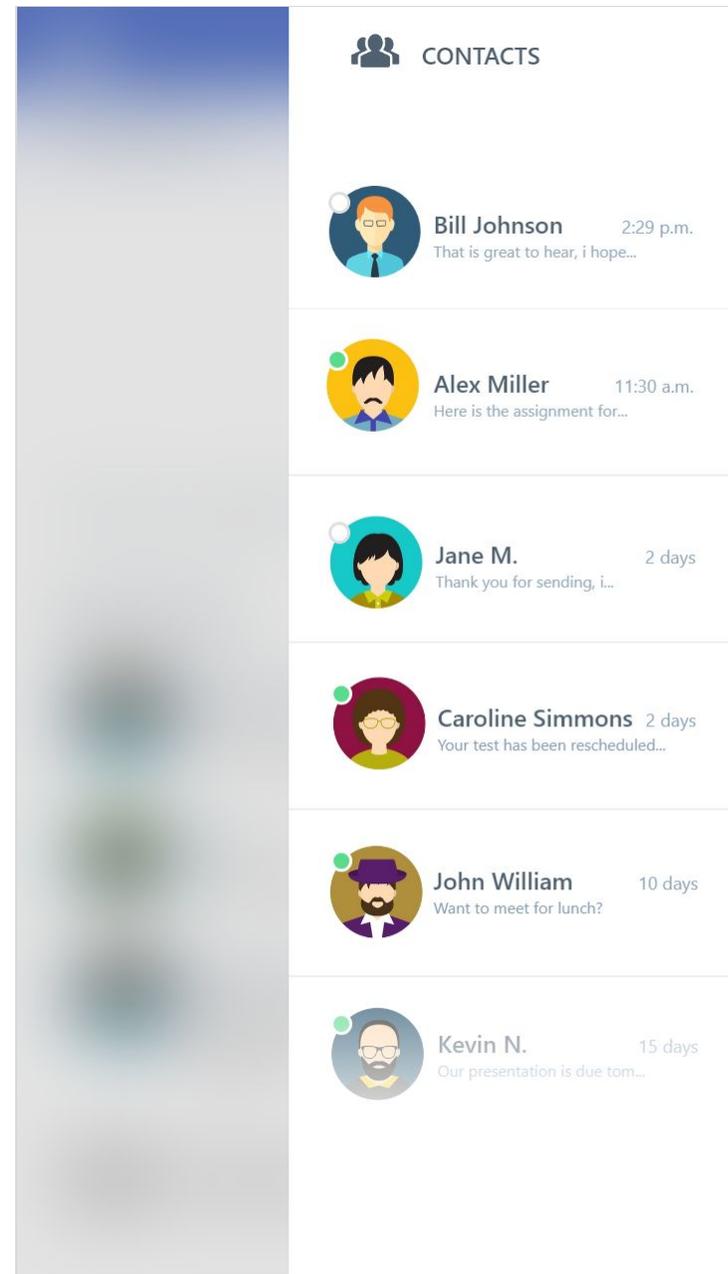
This window displays the most recent contacts that the user has talked to. It is opened with the contacts icon is clicked (upper right corner).

1.15.2 Functionality

- Networking

1.15.3 Critical Components

- Icons for Profiles (To be determined)



1.16 Settings

1.16.1 Intention

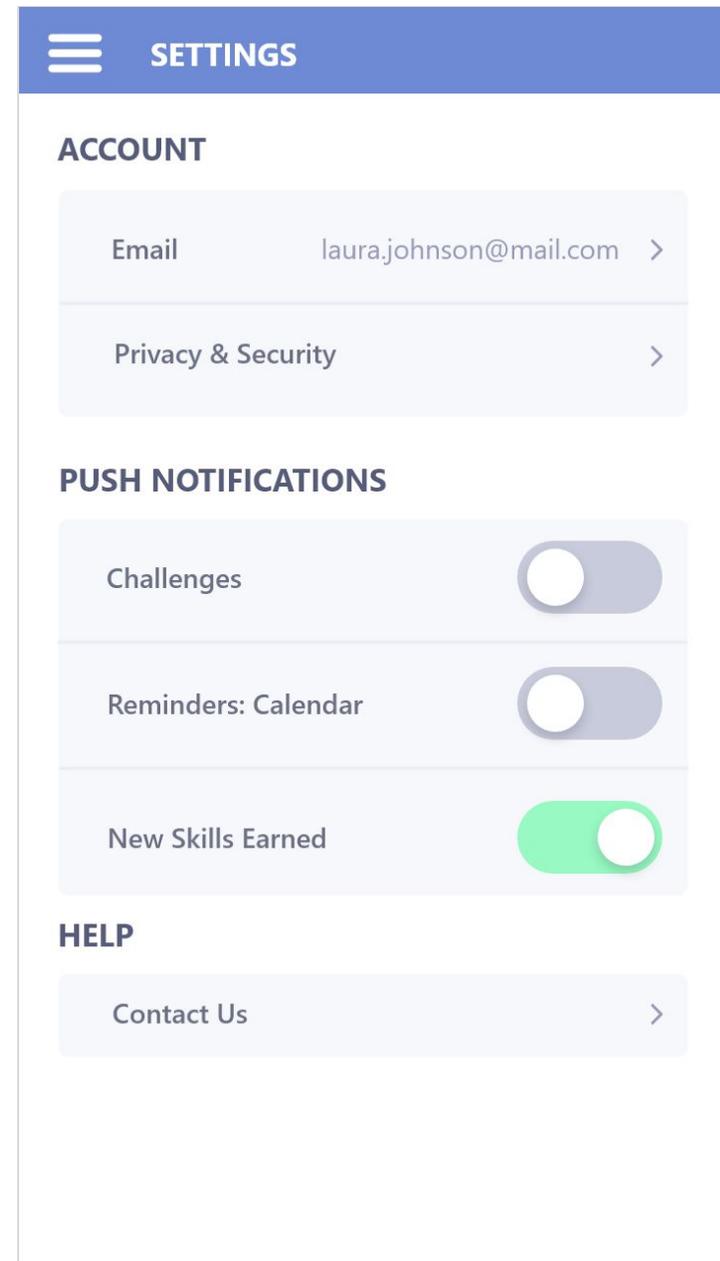
Allows the user to configure the app (i.e. personalization, account, privacy, etc)

1.16.2 Functionality

- [Uses [Navigation Button](#)]
- Configure settings that affect the app, to be determined

1.16.3 Critical Components

- To be determined



1.17 Grade Reports/Courses

1.17.1 Intention

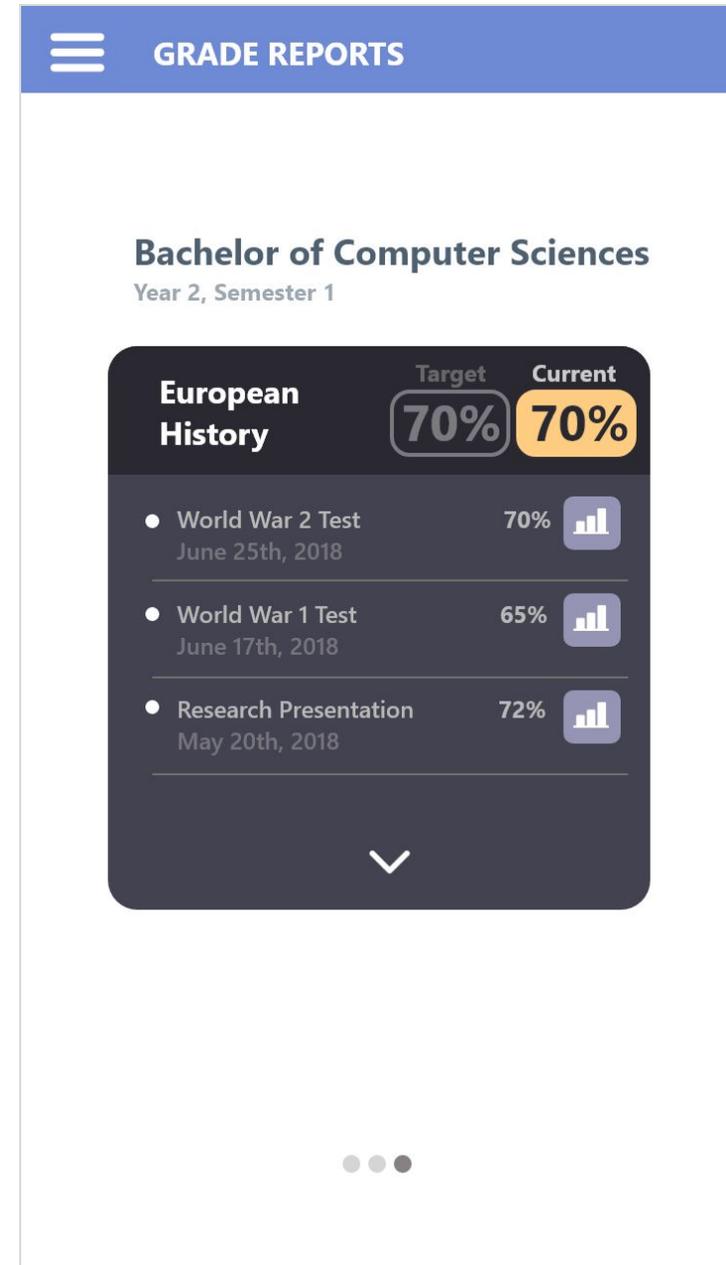
A user can see their school courses in this window, as well as seeing relevant information that can tell the user how they are doing in each class.

1.17.2 Functionality

- [Uses [Navigation Button](#)]
- Panels
 - Swipe panels left and right, to navigate in this window
- Current Grade
- Grade Color
 - ASD Facilitator sets a grade goal for the student
 - Green: exceeding expectations
 - Yellow: meeting expectations
 - Red: below expectations
- Target Grade
- Graph Button
 - Brings up the [Course Goal](#) and [Histogram](#) Graphs

1.17.3 Critical Components

- None



1.18 Grade Reports/Courses - Course Goal Graph

1.18.1 Intention

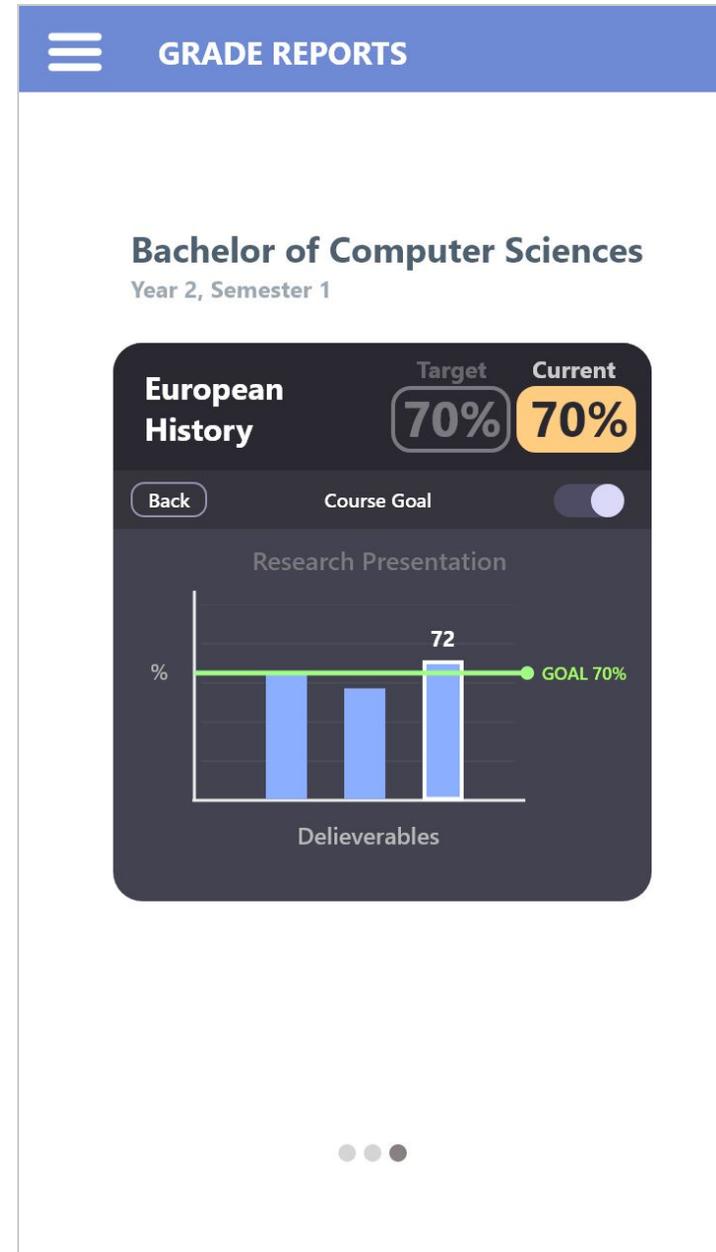
In this view, the user can look at their grade on an assignment/test and compare it to the goal for the course, and previous assignments.

1.18.2 Functionality

- Bar Graph
 - Highlights current assignment in class, and previous assignments
- Goal Line
- [Uses [Toggle](#)]
- [Uses [Back Button](#)]

1.18.3 Critical Components

- None



1.19 Grade Reports/Courses - Histogram Graph

1.19.1 Intention

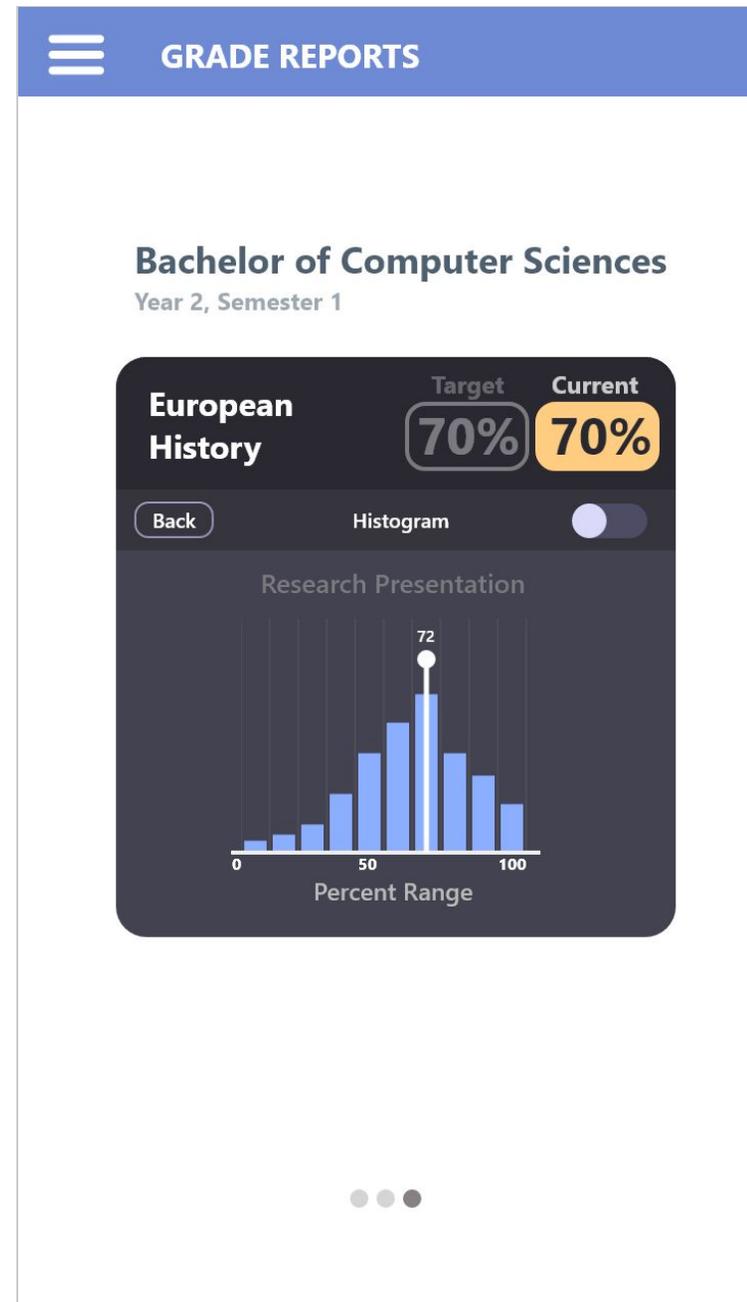
In this view, the user can look at their assignment/grade and compare to where it falls compared all the deliverables submitted, and what percent range it falls into.

1.19.2 Functionality

- Data organized into a histogram
- Line: Displaying what percentage range it falls under, compared to all the assignments submitted
- [Uses [Toggle](#)]
- [Uses [Back Button](#)]

1.19.3 Critical Components

- None



1.20 Challenges

1.20.1 Intention

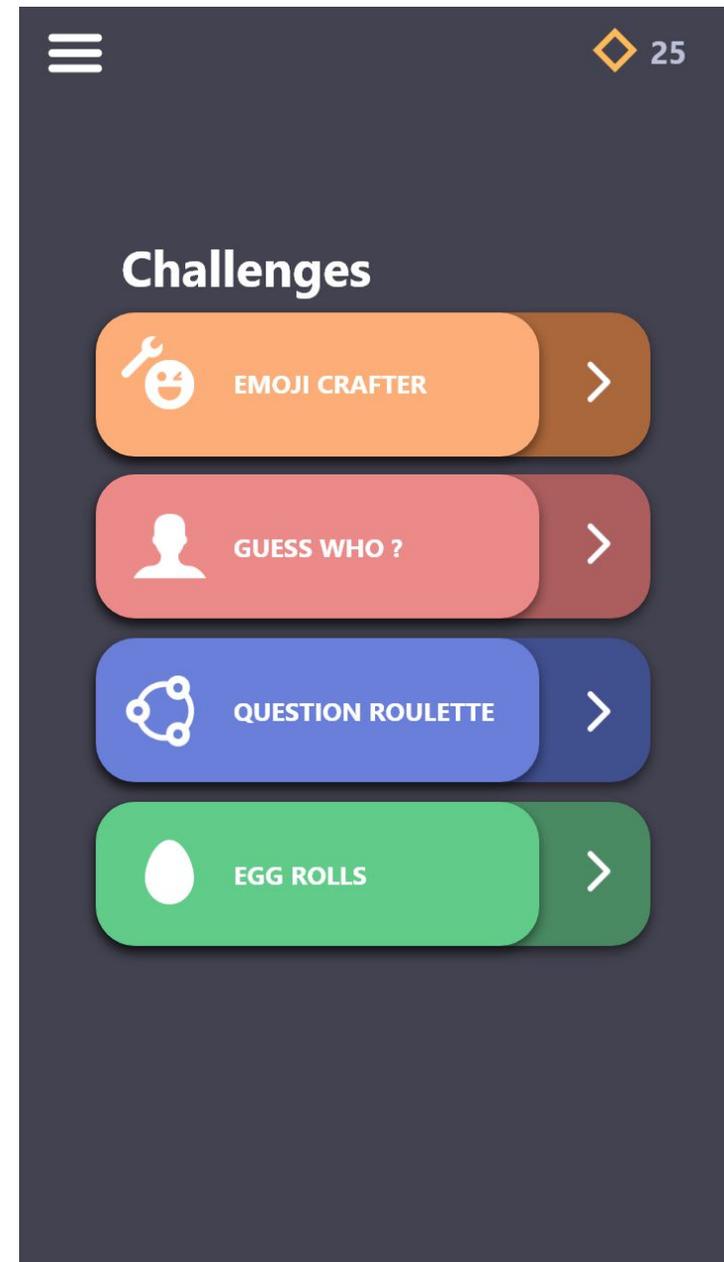
In this window, the user will take part in a mini-game that teaches the user a key social skill (i.e. verbal communication). The user can choose to play a mini game from a scrollable selection.

1.20.2 Functionality

- [Uses [Navigation Button](#)]
- [Uses [Skill Point Counter](#)]
- Each Mini-Game is presented as a tab
 - Click on arrow to initiate the mini-game
- Example Mini-Game: [Emotion Crafter](#)

1.20.3 Critical Components

- Mini-Game Icons



1.21 Skills - Skills List

1.21.1 Intention

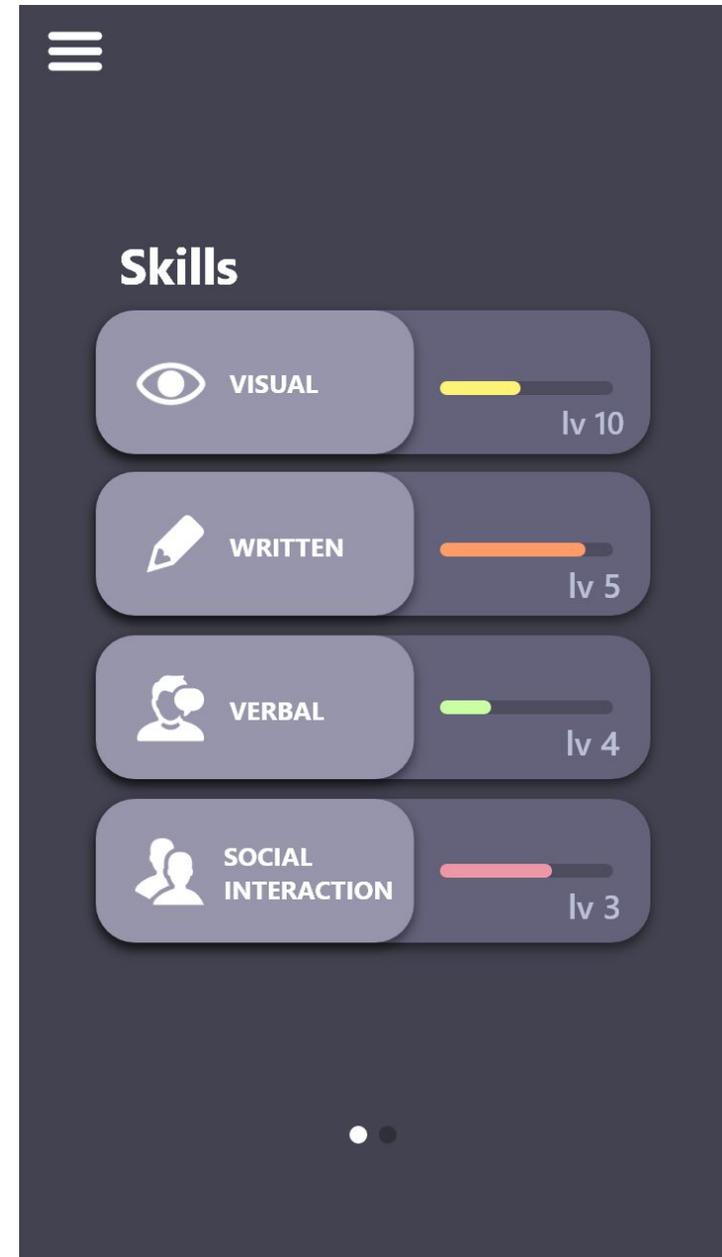
This window displays the **social communication skill levels** that a user has acquired. Information is organized by progress bars that show how much experience they need in order to get to the next level in a particular category.

1.21.2 Functionality

- [Uses [Navigation Button](#)]
- Adding experience points (by completing challenges) increases the progress bar of a particular skill (i.e. social interaction).
- The level is written underneath the progress bar

1.21.3 Critical Components

- Communication Skill Icons
 - Visual
 - Verbal
 - Written
 - Social Interaction
- Progress Bar
 - Background
 - Fill



1.22 Skills - Badges

1.22.1 Intention

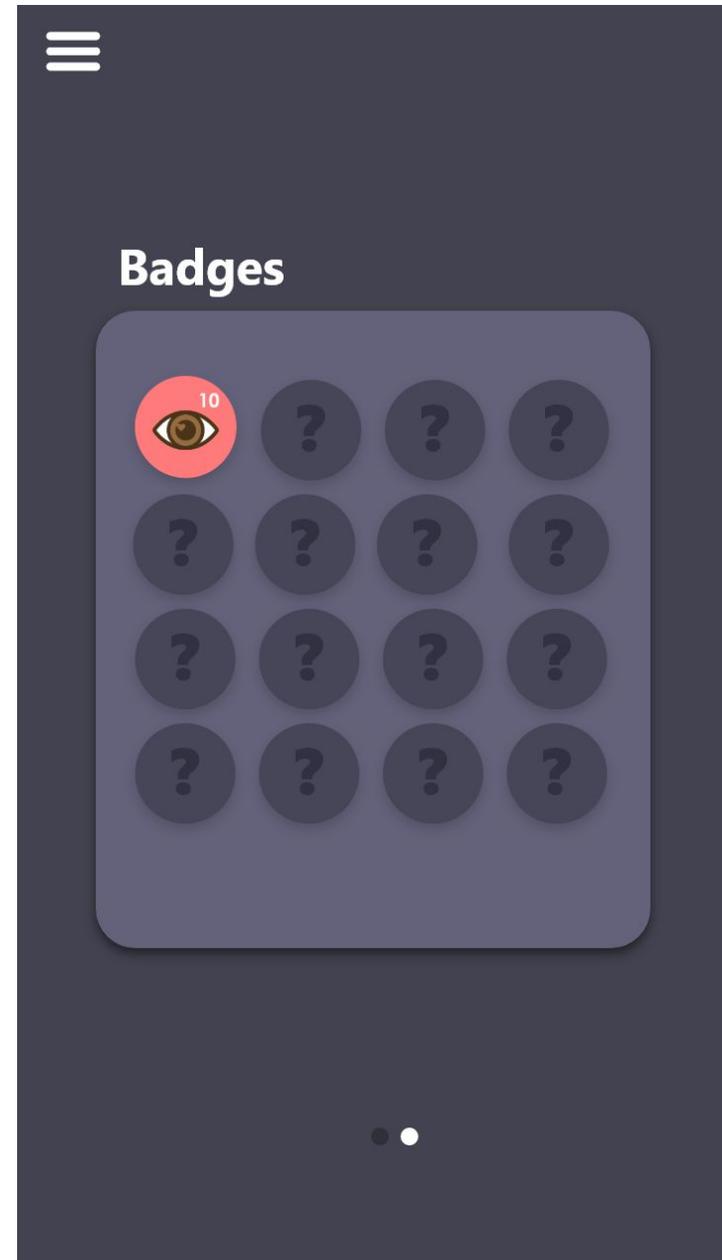
This window shows the user what badges they have received for completing various challenges and etc. If the user clicks on a badge, a [notification window](#) pops up, which describes the badges properties.

1.22.2 Functionality

- [Uses [Navigation Button](#)]
- Put a new badge in a slot

1.22.3 Critical Components

- Sample placeholder assets that are earned
- Locked badge icon (i.e. question mark)



1.23 Pet Room - General Overview

1.23.1 Intention

When the user is idle in the pet room, the UI of the shop and inventory go away. The screen is left to showcase the users animated pet, performing animations (i.e. emotions, tricks, etc).

1.23.2 Functionality

- None

1.23.3 Critical Components

- An animated pet avatar
- Floor asset
- Background Image
- Panel (Folder)
 - Tabs
 - Shop
 - Inventory

1.24 Pet Room - Shop

1.24.1 Intention

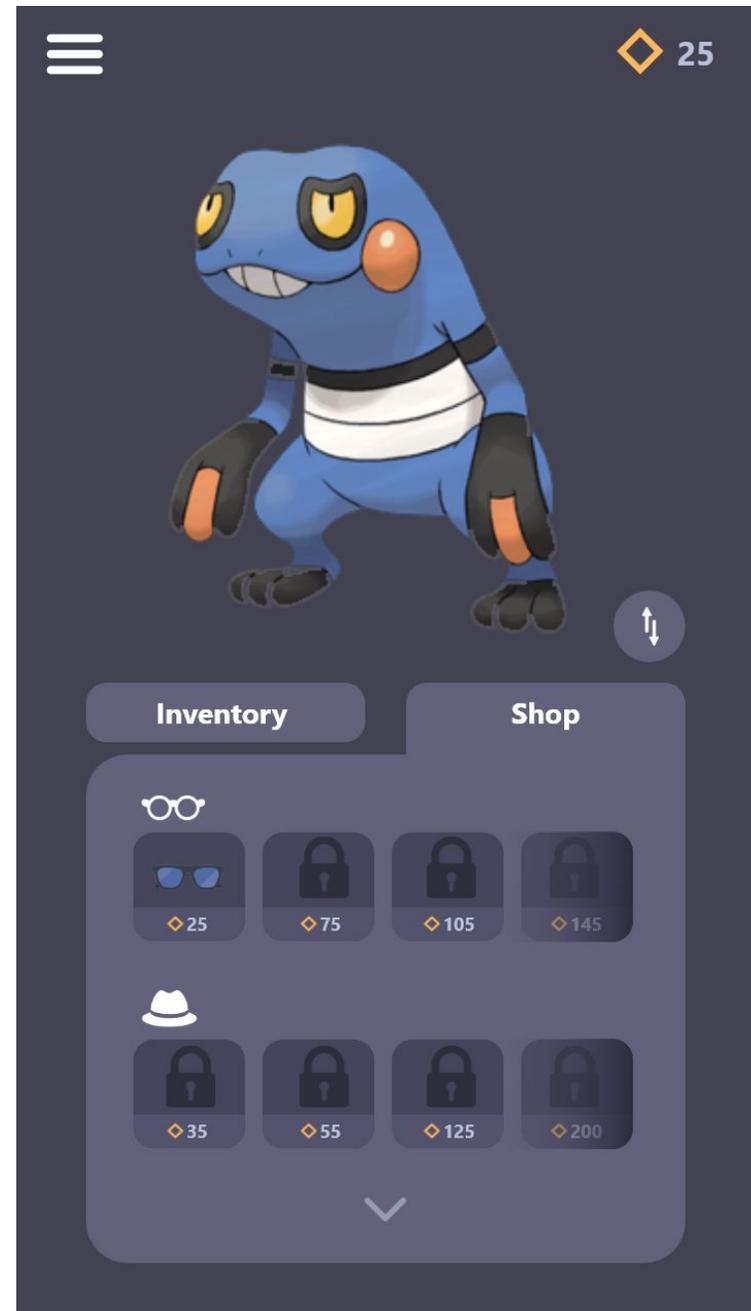
This window is designed to showcase to the user what upgrades/accessories they can purchase and equip onto their pet. To increase engagement overtime, additional items can be added during seasons (i.e. halloween themed outfits).

1.24.2 Functionality

- [Uses [Navigation Button](#)]
- [Uses [Skill Point Counter](#)]
- Slots for items
- Click to purchase (if enough skill points are available) [[Notification - Purchase Item](#)] [[Notification - Not Enough Funds For Item Purchase](#)]
- Cost of an item
- Gradient scroll through item list (back and forth)
- [Sort By Button](#)

1.24.3 Critical Components

- Sample Placeholder Icons (to be decided)



1.25 Pet Room - Shop - Sort By

1.25.1 Intention

This window is opened when the user hits the Sort By Button in the shop.

The user is allowed to sort the shop inventory by:

- A to Z
- Price: Lowest to Highest
- Price: Highest to Lowest

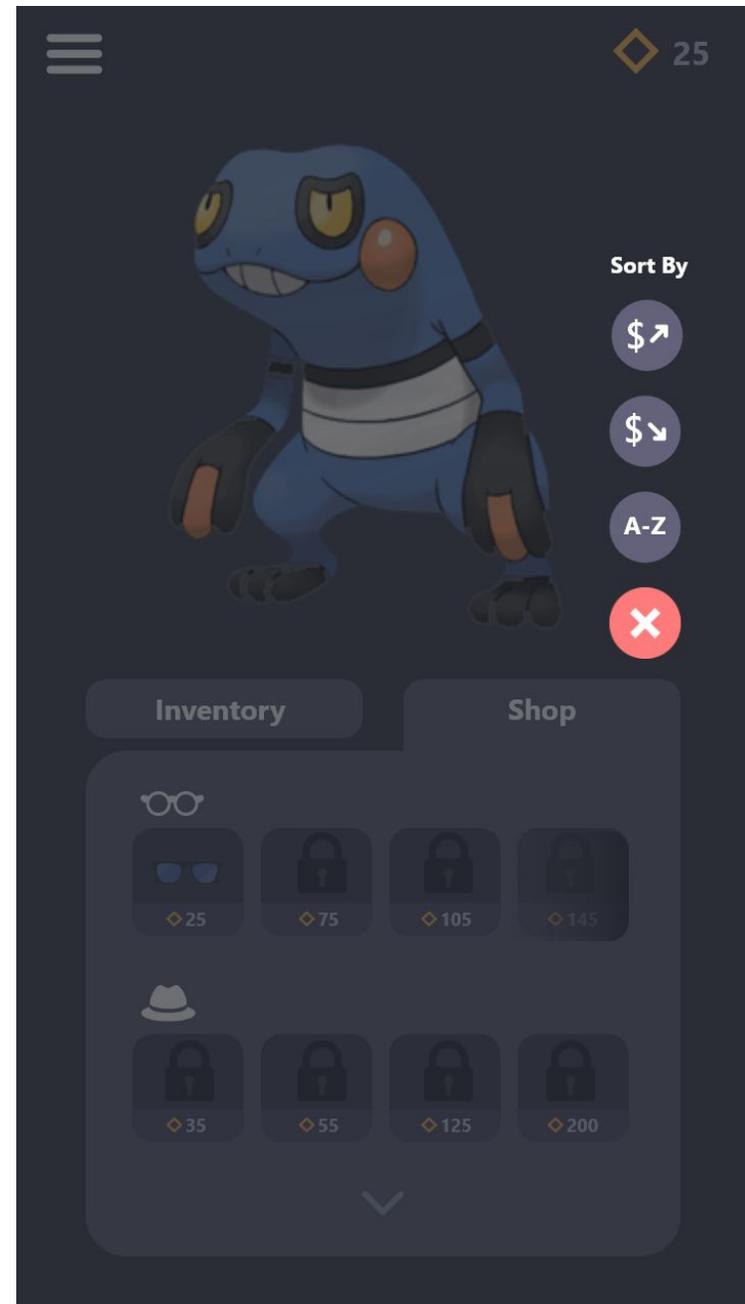
Additional Feature: Items can be categorized using tags (i.e. halloween), the user can search the store using those tags. This can be useful for seasonal outfits or special event outfits.

1.25.2 Functionality

- [Uses [Back Button](#)]
- The user can also exit this view by tapping on the darker overlay
- Sort Button - sorts the shop inventory to user preference
 - A to Z
 - Price: Lowest to Highest
 - Price: Highest to Lowest

1.25.3 Critical Components

- 3 Custom Icons for different sorting preferences



1.26 Pet Room - Inventory

1.26.1 Intention

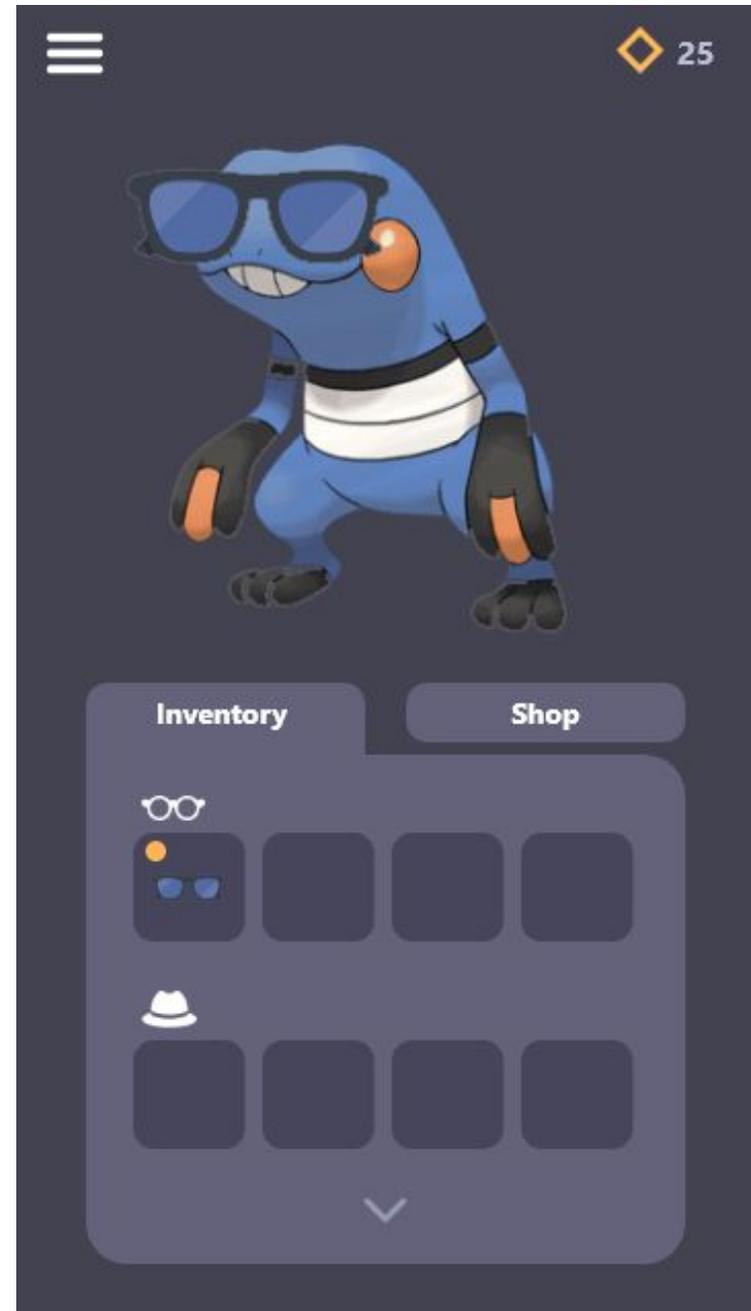
This window is designed to display what items the user has already purchased. These items are equippable onto the users pet.

1.26.2 Functionality

- [Uses [Navigation Button](#)]
- [Uses [Skill Point Counter](#)]
- Inventory Item Slots
 - Item appears in slot when it is purchased from [Shop](#).
- Clicking on a item allows user to equip it onto the pet [[Notification - Equip Item](#)]
 - Once an item is equipped, a coloured circle will appear in the item inventory slot (see image)

1.26.3 Critical Components

- Sample placeholder icons for items (to be decided)



1.27 Notification - Purchase Item

1.27.1 Intention

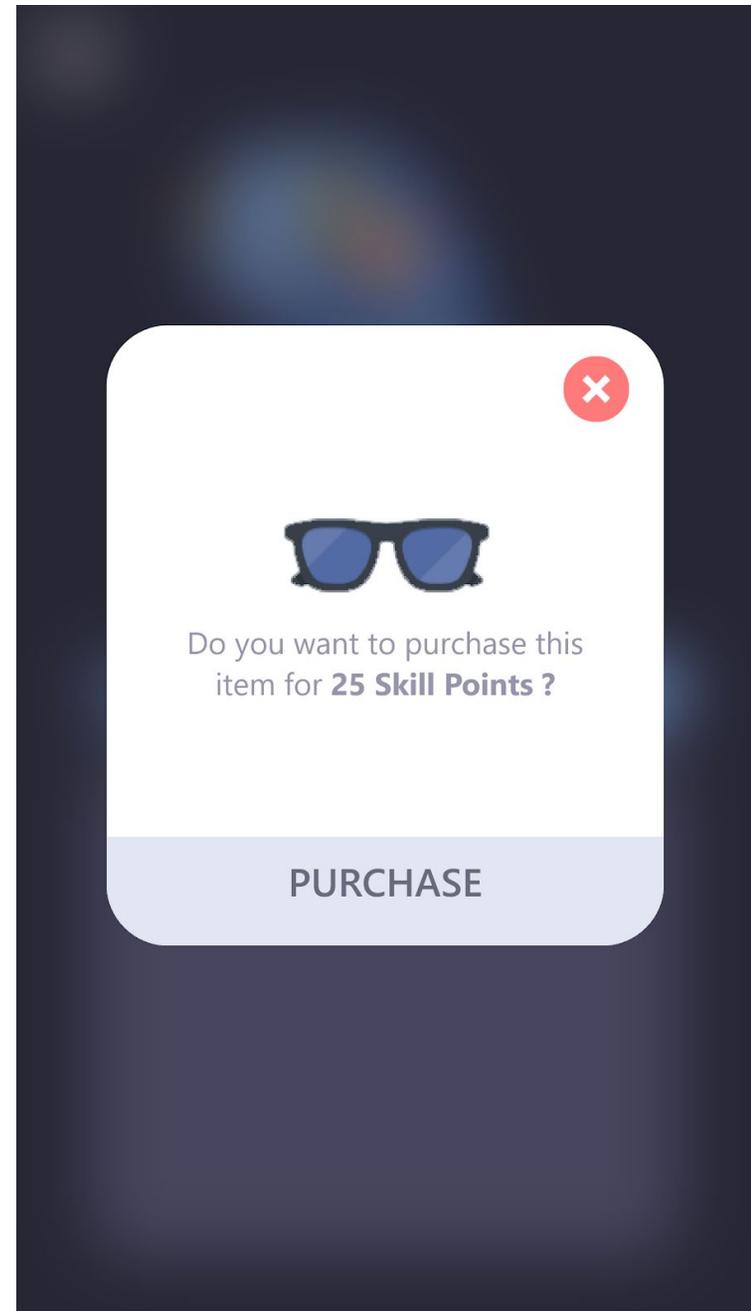
This notification window tells the user if they want to confirm their purchase or not.

1.27.2 Functionality

- [Uses [Button Press](#)]
- [Uses [Notification](#)]

1.27.3 Critical Components

- None



1.28 Notification - Equip Item

1.28.1 Intention

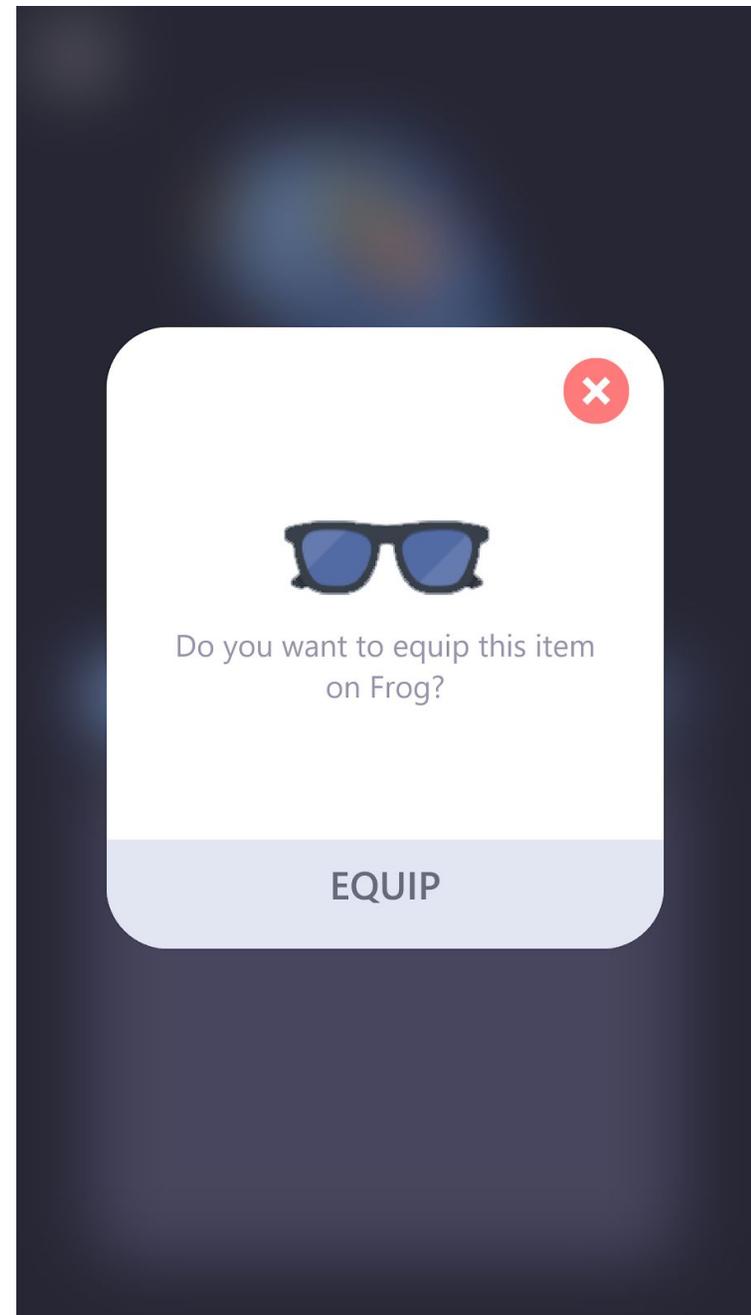
This notification asks the user if they want to equip the current item selected from the inventory onto the character.

1.28.2 Functionality

- [Uses [Button Press](#)]
- [Uses [Notification](#)]

1.28.3 Critical Components

- None



1.29 Notification - Not Enough Funds For Item Purchase

1.29.1 Intention

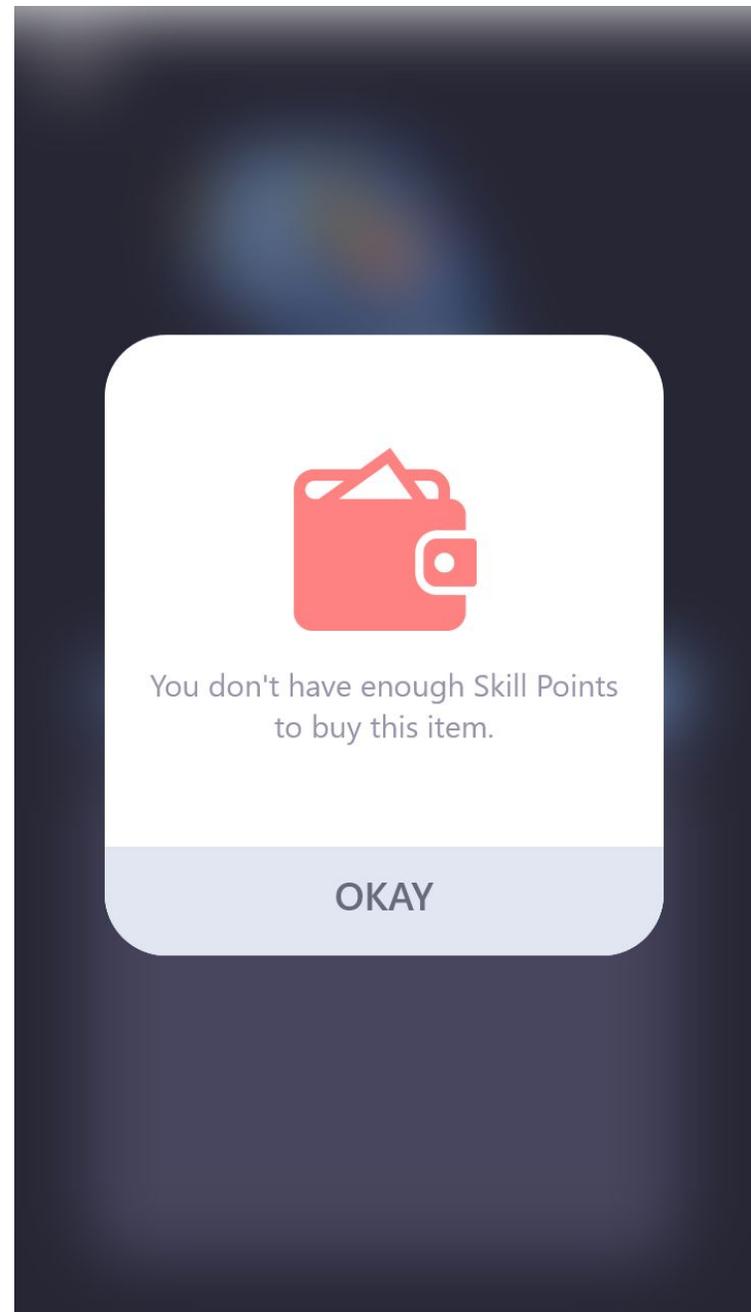
This notification shows the user that they can't purchase the current item because they don't have enough Skill Points.

1.29.2 Functionality

- [Uses [Button Press](#)]
- [Uses [Notification](#)]

1.29.3 Critical Components

- Empty Wallet Icon



1.30 Notification - Save Changes

1.30.1 Intention

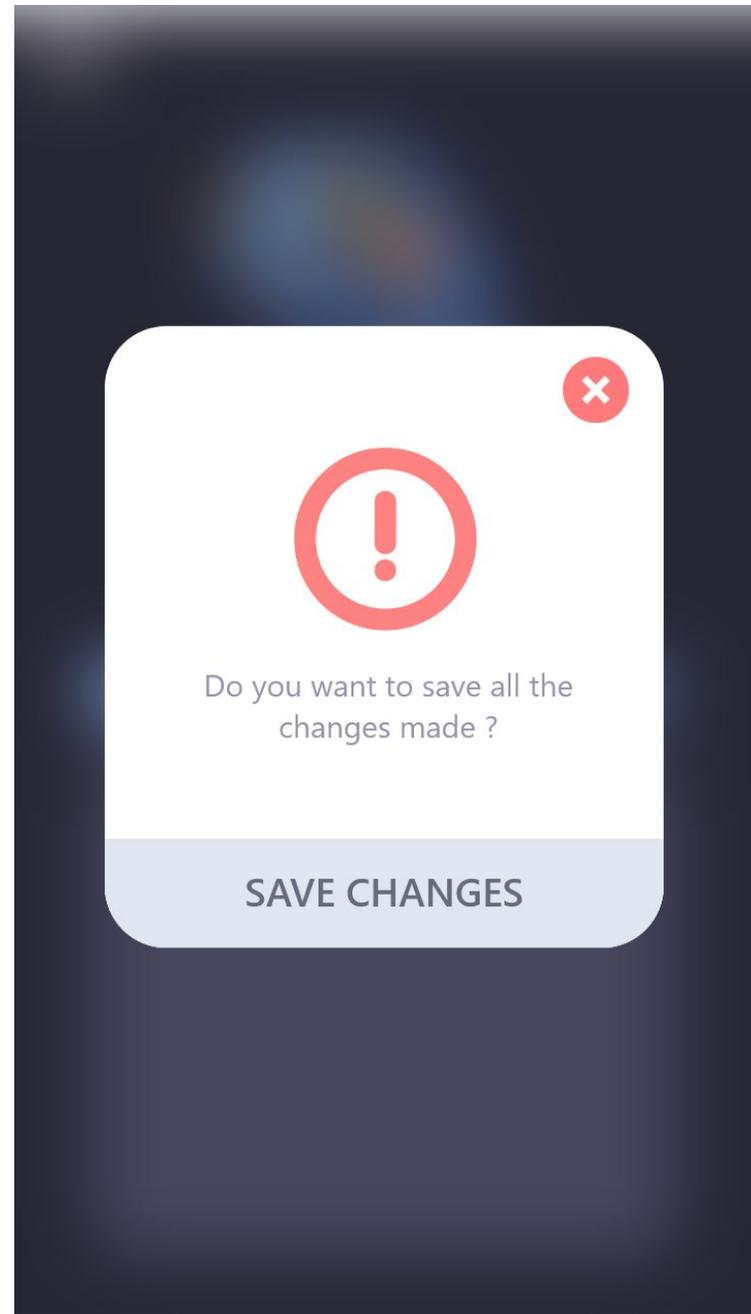
This notification tells the user if he wants to save the changes made to the pet.

1.30.2 Functionality

- [Uses [Button Press](#)]
- [Uses [Notification](#)]

1.30.3 Critical Components

- Exclamation Icon



1.31 Notification - Earned Badge

1.31.1 Intention

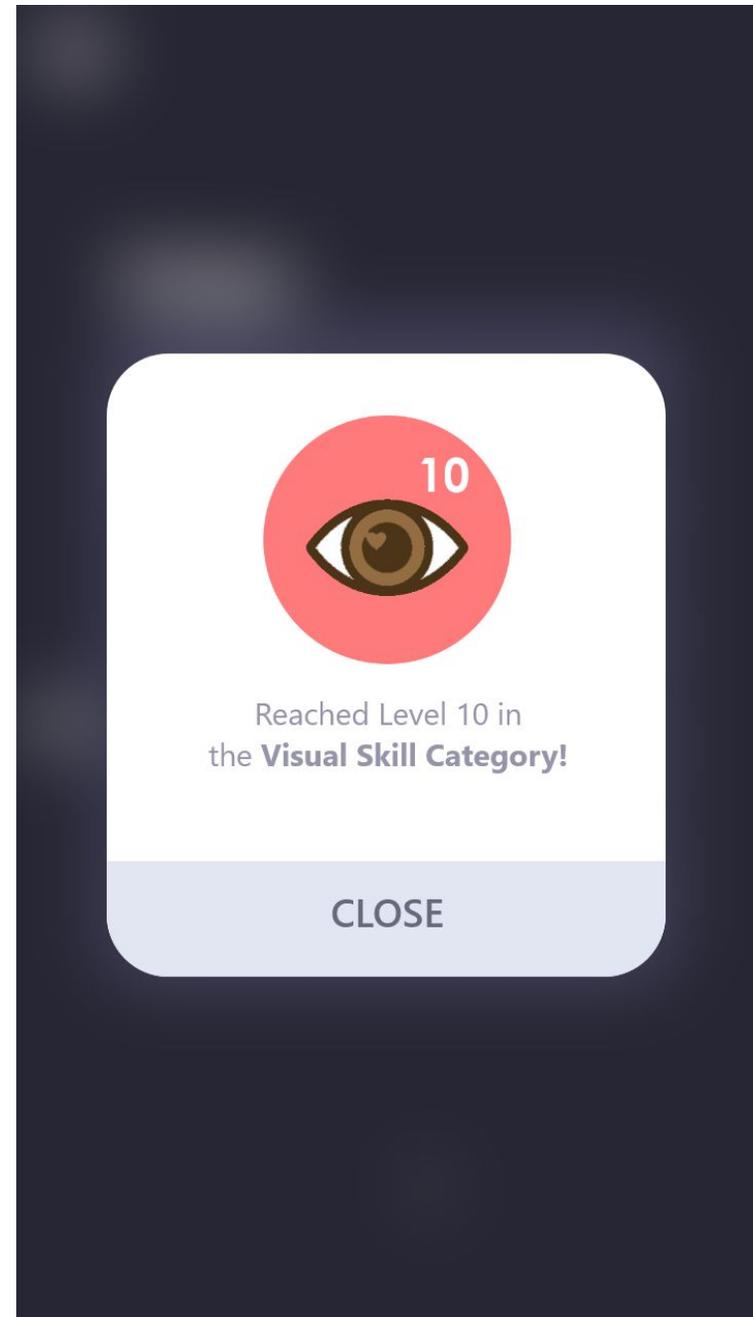
This notification shows the user that they have earned a badge for successfully completing something for the calendar or challenges.

1.31.2 Functionality

- [Uses [Button Press](#)]
- [Uses [Notification](#)]

1.31.3 Critical Components

- Custom Earned Badge Icon



1.32 Notification - Earned Social XP/Skill Points

1.32.1 Intention

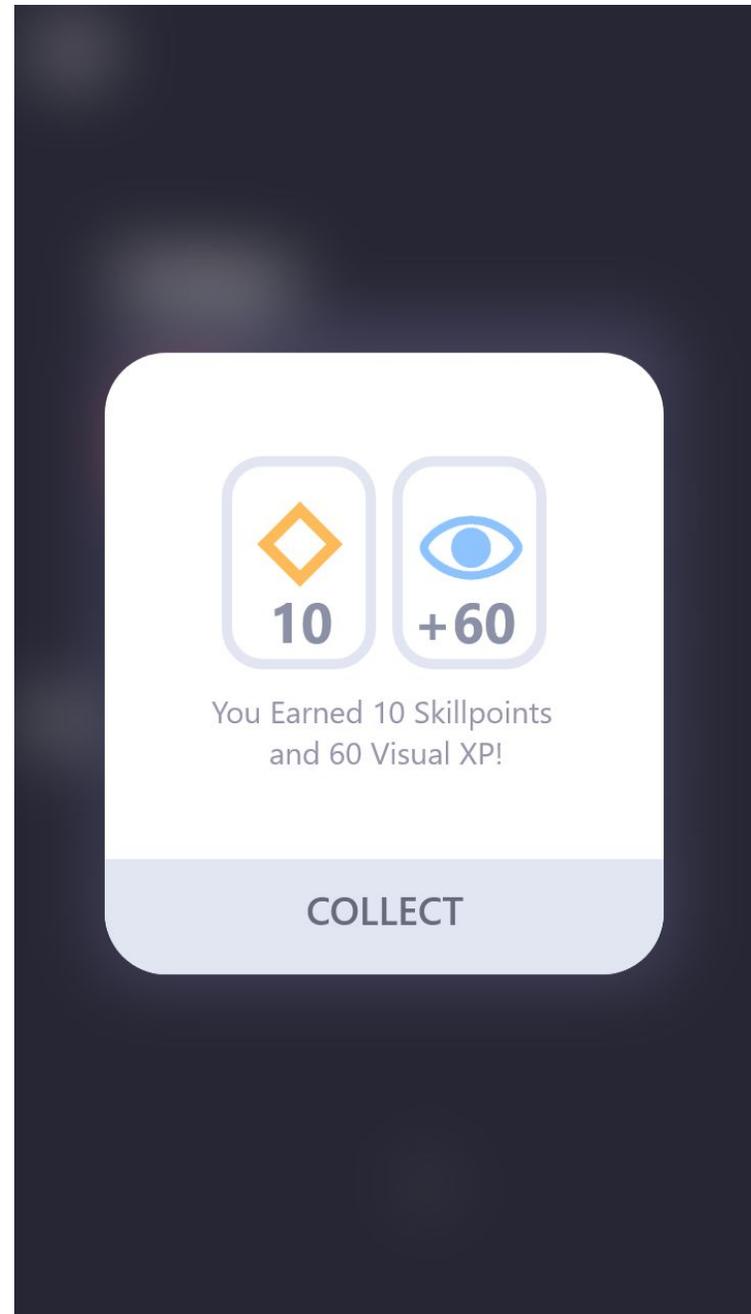
This notification displays how many Social Communication XP and Skill Points that the user has earned while playing a mini-game. This appears after the mini-game is completed.

1.32.2 Functionality

- [Uses [Button Press](#)]
- [Uses [Notification](#)]

1.32.3 Critical Components

- None



1.33 Notification - Leveled Up

1.33.1 Intention

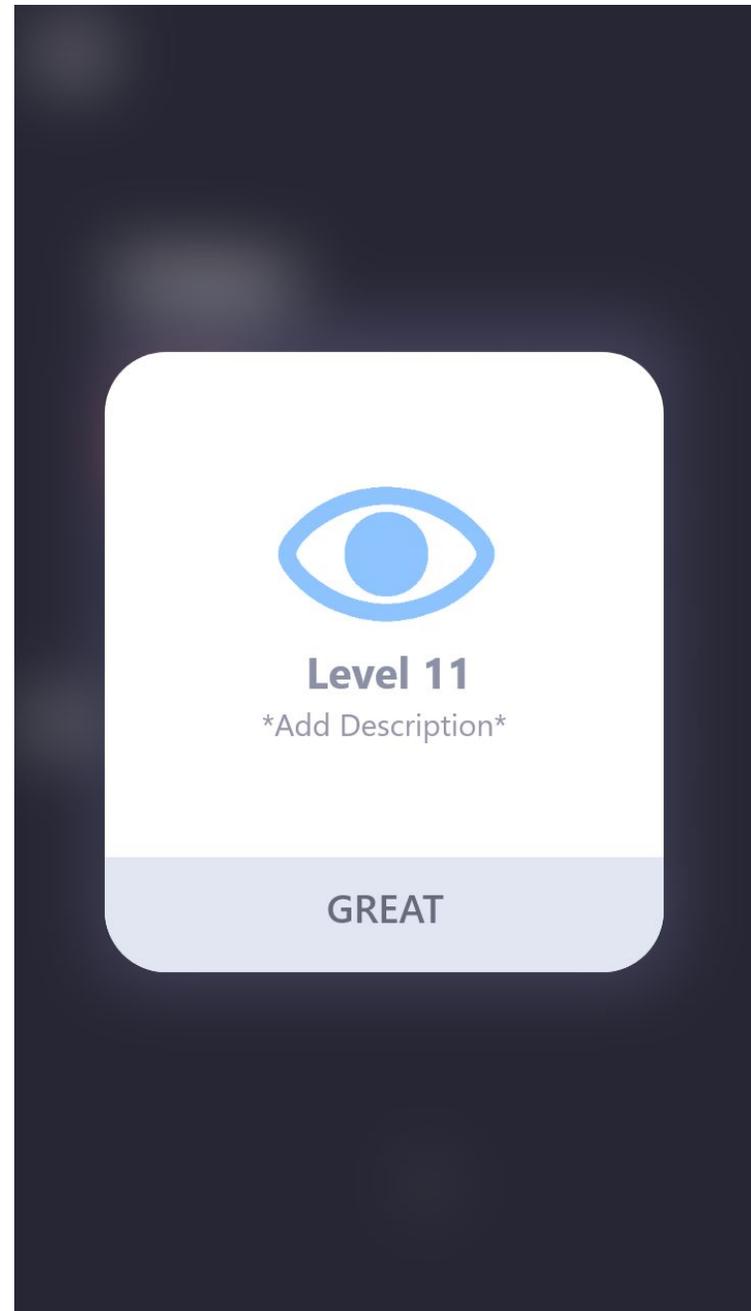
This notification is displayed when the user levels up in a particular skill category.

1.33.2 Functionality

- [Uses [Button Press](#)]
- [Uses [Notification](#)]

1.33.3 Critical Components

- Social Communication Icon



1.34 Notification - Mass Event

1.34.1 Intention

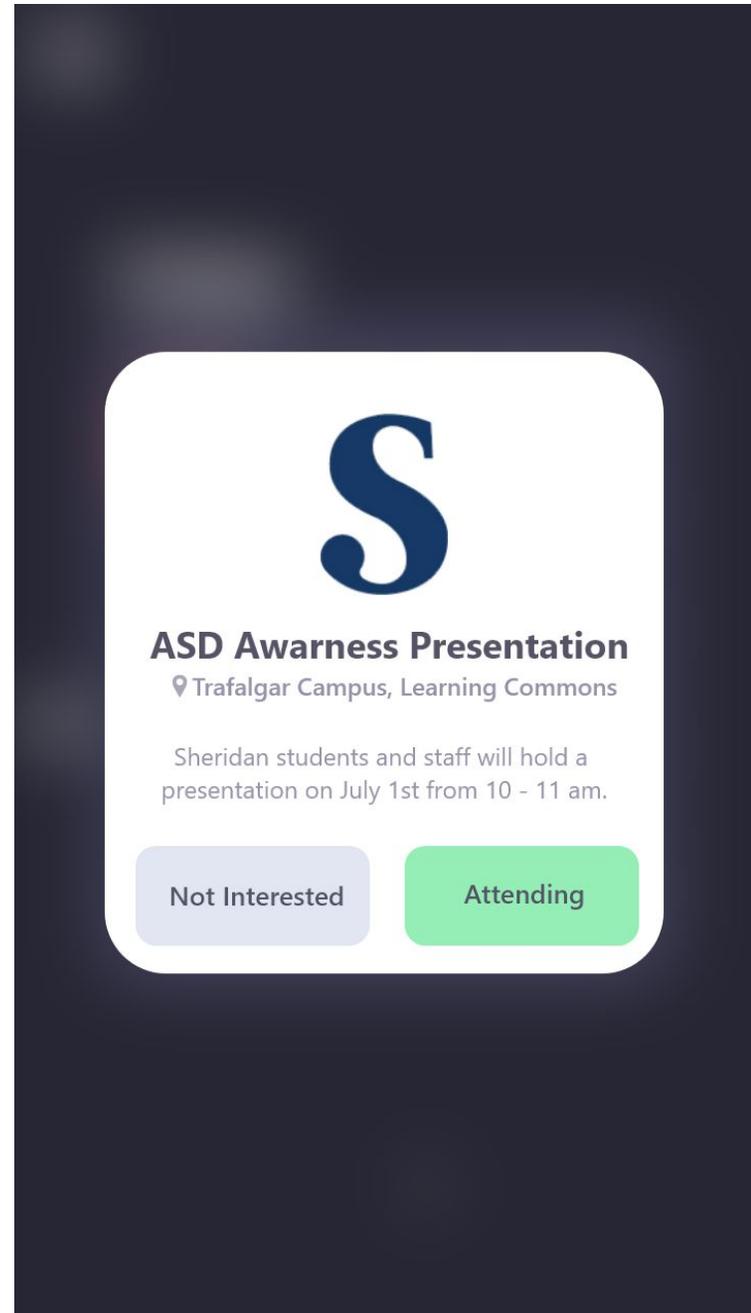
The user receives this notification from the ASD facilitator which he or she sends to all ASD individuals in the database, inviting the student to attend a social gathering, event, etc.

1.34.2 Functionality

- [Uses [Button Press](#)]
- [Uses [Notification](#)]
- **Additional Feature:** the facilitator can put in a poll to see who is and is not interested in going to a particular event, etc.

1.34.3 Critical Components

- None



1.35 Notification - Remove Event On Calendar

1.35.1 Intention

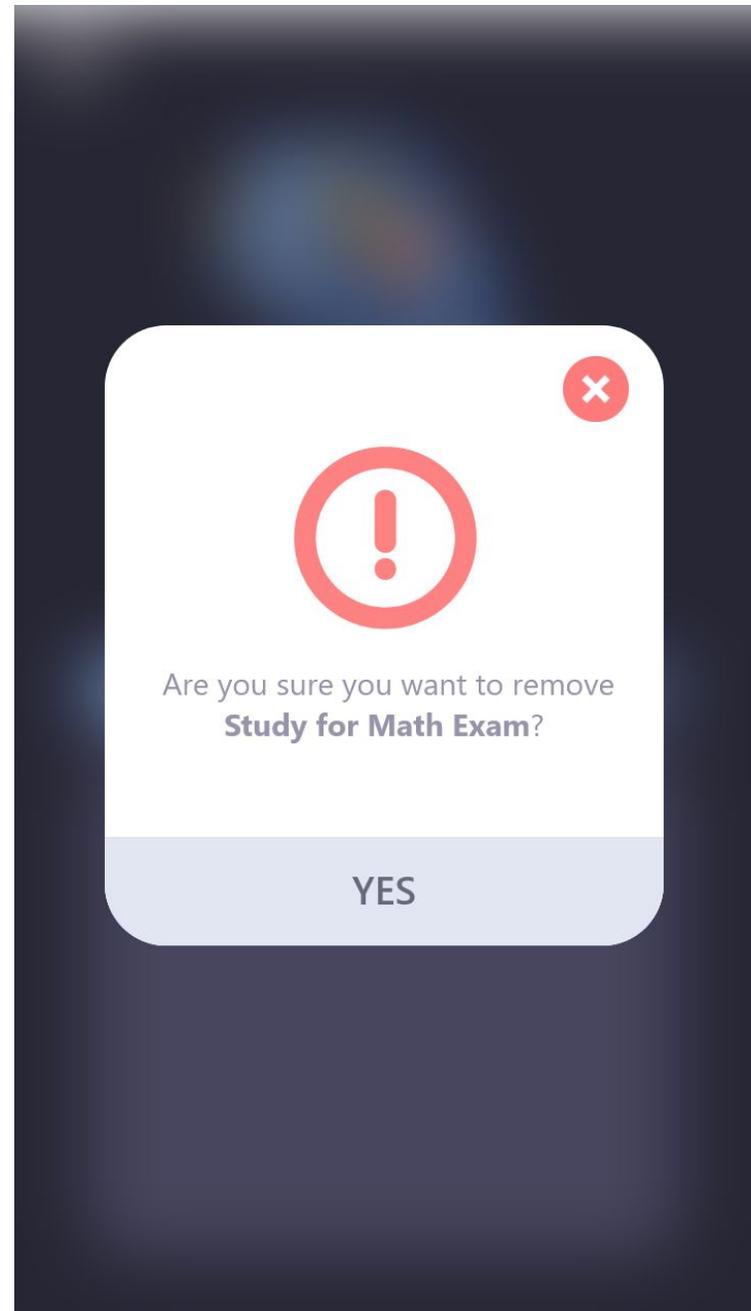
The user receives this notification, if they want to remove an event that is on the calendar.

1.35.2 Functionality

- [Uses [Button Press](#)]
- [Uses [Notification](#)]

1.35.3 Critical Components

- None



2.0 Common Systems

A list of systems, assets and functionality that are used multiple times throughout the application.

2.1 Button Press

2.1.1 Code

- Depresses (feedback) when tapped
- Calls a function to do something

2.1.2 Art

- Long rectangle button
- Medium Rectangle button
- Bar Fill
- Bar Background



2.2 Back Button

2.2.1 Code

- Uses Button Press
- Links the user back to the previous screen that they visited

2.2.2 Art

- Text ("Back")
- Rectangle Image Background



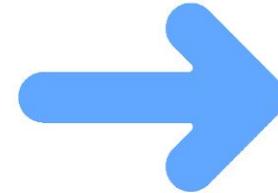
2.3 Arrow Button

2.3.1 Code

- Moves the user to the next screen

2.3.2 Art

- Arrow Icon



2.4 Navigation Button

2.4.1 Code

- If the button is pressed it overlays the screen with the navigation window
- Slide-In
- Darkens the background (blur effect)

2.4.2 Art

- Custom Icon



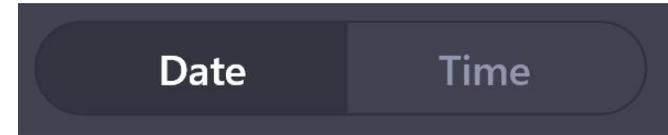
2.5 Toggle

2.5.1 Code

- Two different variables that the user can control on one button
- Only one variable can be selected, (i.e. On/Off Switch)

2.5.2 Art

- Two Buttons
- Dark Fill (selected) and Light Fill (unselected)



2.6 Radial Progress Bar

2.6.1 Code

- The radial bar fills overtime (simulating a task is being done)
- Turns off the event when the bar fully fills up
 - Changes to next node in the task list

2.6.2 Art

- Radial Bar Fill
- Radial Bar Background



2.7 Notched Progress Bar

2.7.1 Code

- Small Nodes are placed on the progress bar, underneath is a one or two word description
- As it is progressing, it makes the text larger and changes its color
- Nodes that are not visited are faded



2.7.2 Art

- Circle Node
- Progress Bar Background
- Progress Bar Fill

2.8 Text Input Field

2.8.1 Code

- The user is able to write a string of text into a field (box)
- The string of text is saved and stored into the app (i.e. Pet and Event Names)

2.8.2 Art

- Rounded Box or Line
- Sample Text (tells the user what to do, i.e. what is pet's name)

What's your pet's name ?

New Event

2.9 Skill Point Counter

2.9.1 Code

- Keeps track of the total Skill Points the user has
- Displays the number along with the Skill Points Icon



2.9.2 Art

- Skill Points Icon

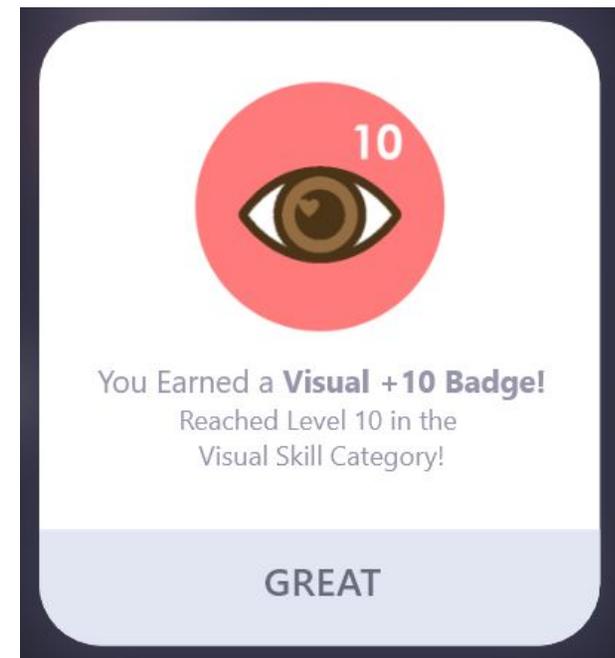
2.10 Notification (Pop-Up Message)

2.10.1 Code

- Appears through a slide-in animation
- Allow for custom text to appear
- Notification removed when cancel button is pressed
- Notification is removed when long rectangle button (action) is pressed

2.10.2 Art

- Panel for notification
- Cancel button
- Long rectangle button



Motify: ASD Facilitator View

Technical Design Document



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1.0 Overview

1.1 The User: ASD Facilitator

Motify will be used as a tool by ASD facilitators to help manage and keep track of students under the spectrum.

1.2 The Problem

One of the main problems with the current system is that **1 ASD facilitator manages up to 500 individuals in the spectrum**. Their current system is documenting information manually, through paper or excel sheets, which is very limited.

1.3 Core Goals

This app will allow the facilitator to easily figure out how to allocate their time effectively with their students. In addition, the ASD facilitator will be able to keep track of the students progression through their academic studies. Each student will have a profile in the Motify app and the data stored in the system includes:

- Calendar
- Skills/ Progression (data on how the student is using the application (i.e. what games are they playing))
- Grades

The ASD individuals are also able to have a more direct connection with the student by directly messaging, sending push notifications, etc.

2.0 App Screens

A breakdown of screens to be implemented within the application.

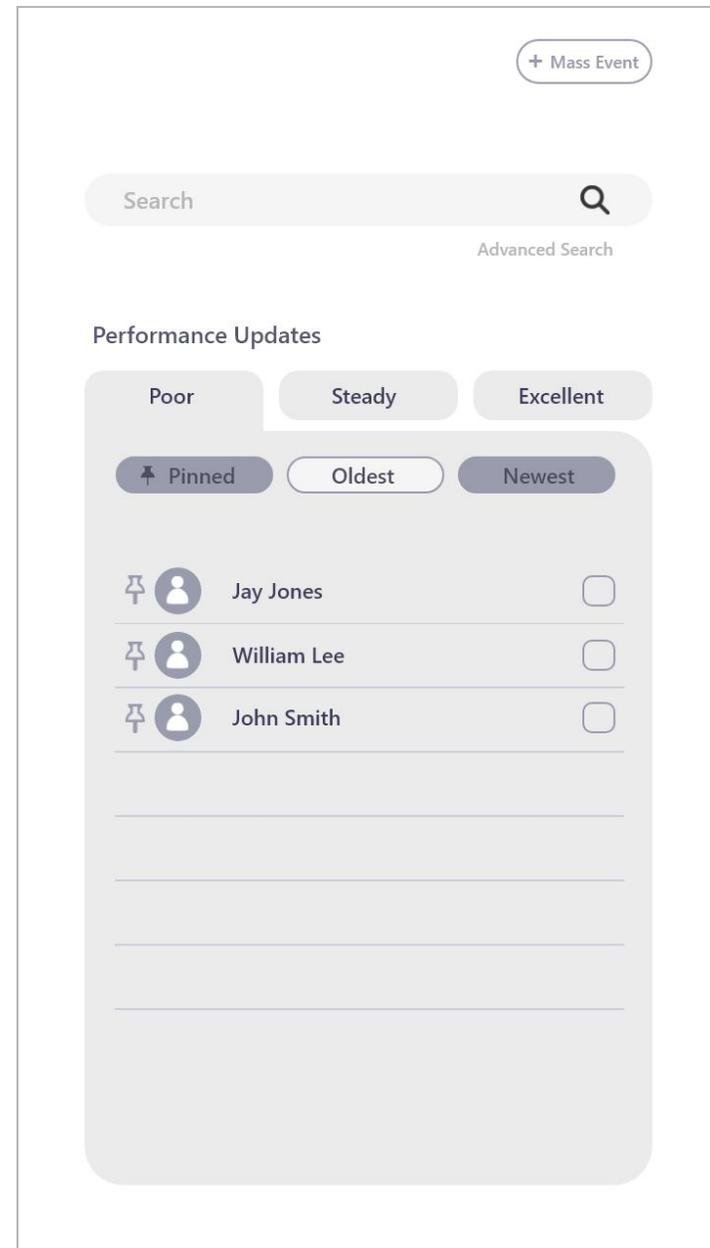
2.1 Homepage - Search Window

2.1.1 Intention

This is the first window the ASD facilitator sees when they open up the application.

Features:

- [Search Bar](#)
- [Performance Updates](#)



2.2 Homepage - Simple Search

2.2.1 Intention

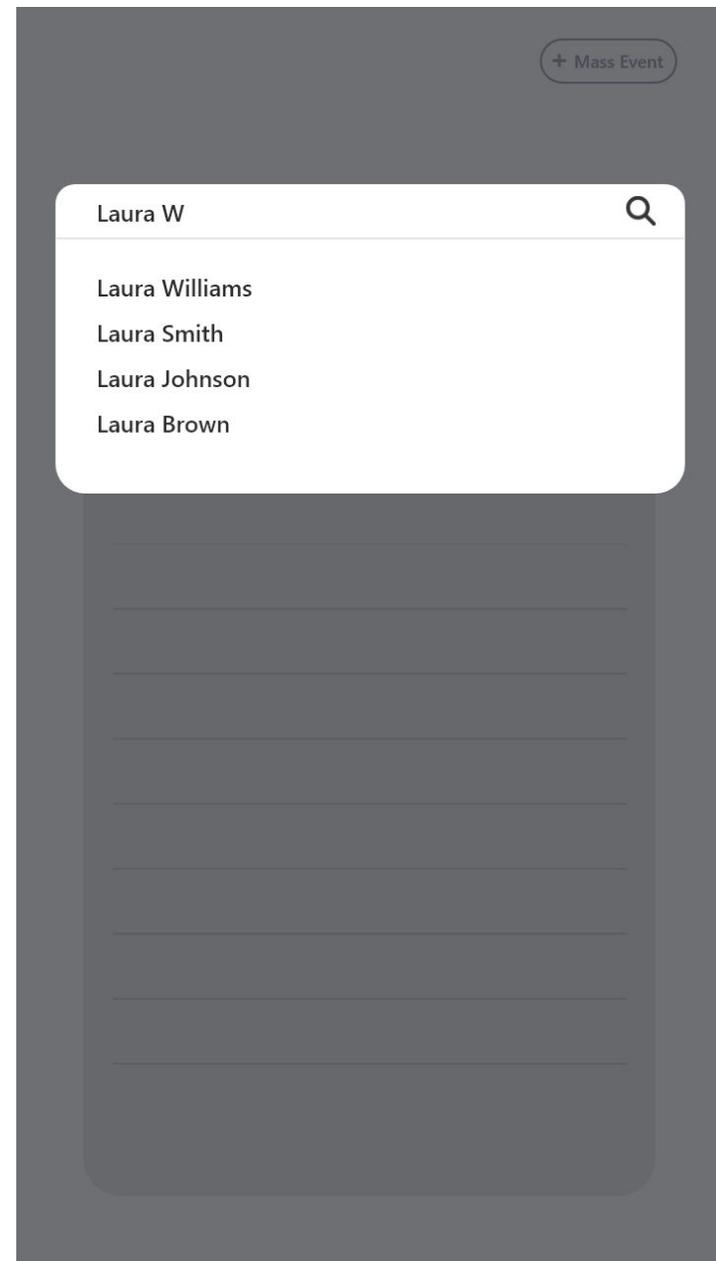
The ASD facilitator can tap/click the search bar, and type in a name to find a student's file in the system's database.

2.2.2 Functionality

- Search Bar - ability to write data and have the system retrieve relevant information
- Auto-suggestions
- Recent searches

2.2.3 Critical Components

- Search Icon



2.3 Homepage - Advanced Search

2.3.1 Intention

The advanced search tab allows the ASD facilitator to input filters that can allow them to sort search results. This window is opened when the advanced search text is clicked (located underneath the search bar).

Some of the search filters include:

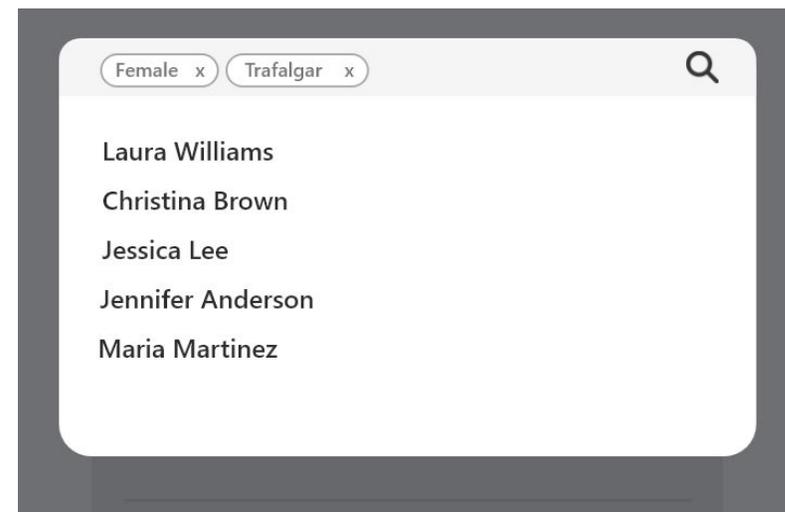
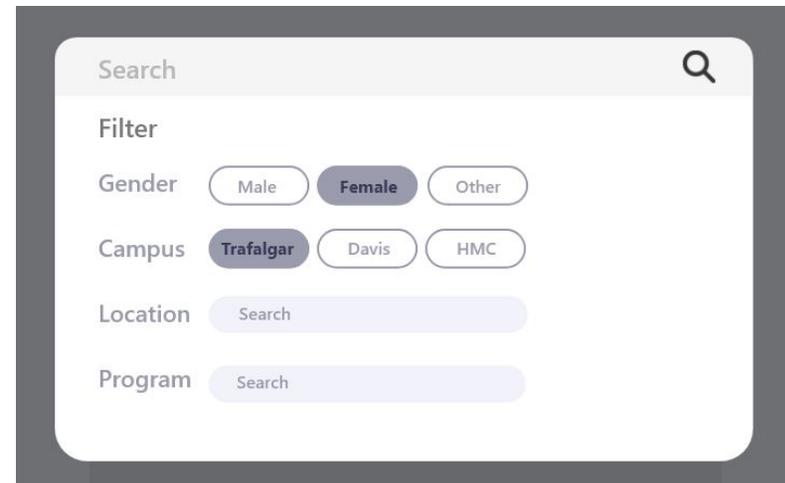
- Gender
- Campus
- Location (Search Bar)
- Program (Search Bar)

2.3.2 Functionality

- [Uses [Toggle](#)] for Filters
 - User is able to click on one or multiple toggle buttons
- Filter Text Fields

2.3.3 Critical Components

- None



2.4 Homepage - Performance Updates

2.4.1 Intention

This window allows the ASD facilitator to view performance updates on students in the system. The students are categorized by how well they are performing in their academic studies. The three categories include:

- Poor
- Steady
- Excellent

A student's profile image and name will be listed on each category. Using this data, the ASD facilitator can allocate time to each student, assisting them with what they need, whether it be to schedule an appointment or send a thumbs up push-notification.

The ASD facilitator can sort the updates on each tab by using an integrated tabs:

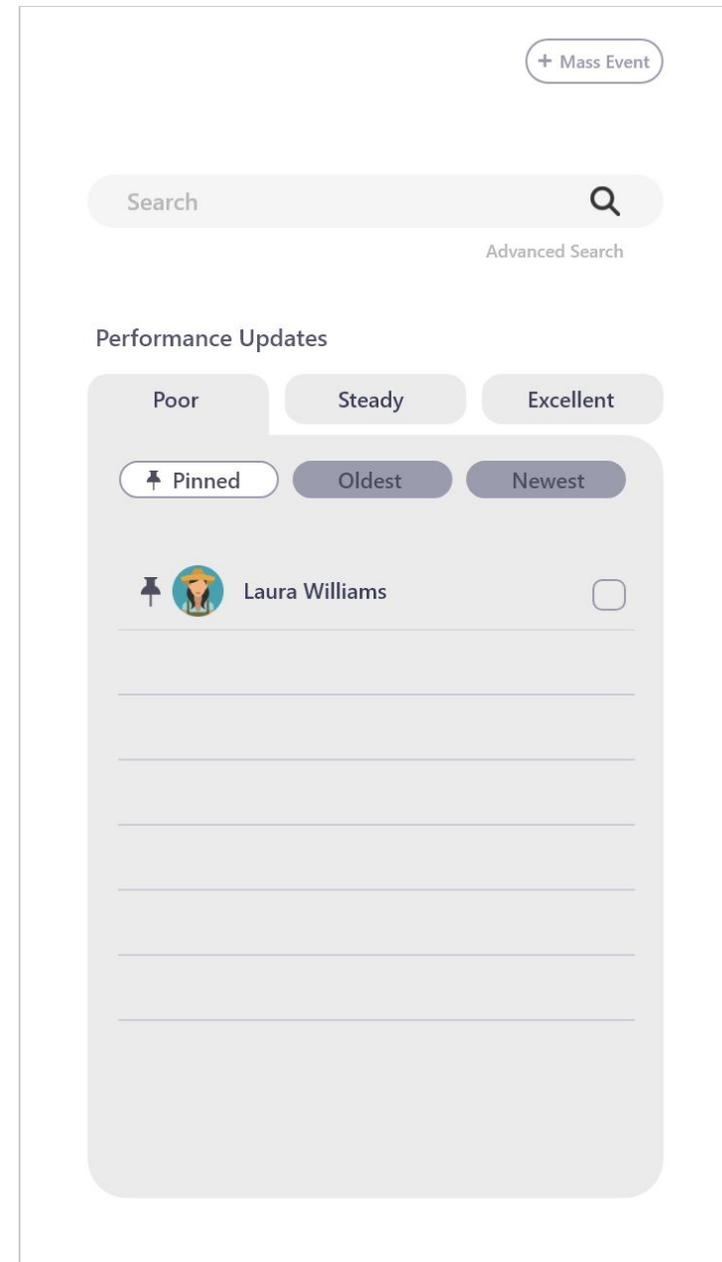
- Pinned
- Oldest
- Newest

2.4.2 Functionality

- 3 Tabs
 - User is able to click tabs and go through the different sections
 - Sub Categories (Pinned, Oldest, Newest)

2.4.3 Critical Components

- None



2.5 Homepage - Performance Updates - Sorting Options

2.5.1 Intention

Each tab in the performance updates has subcategories for sorting (i.e. Pinned, Oldest, Newest). Clicking the empty pin icon, beside the user's profile pins them to the Pinned subcategory.

In addition, multiple users can be selected by tapping on the empty box in the right corner of the profile. A check mark appears, and a hidden menu appears that displays:

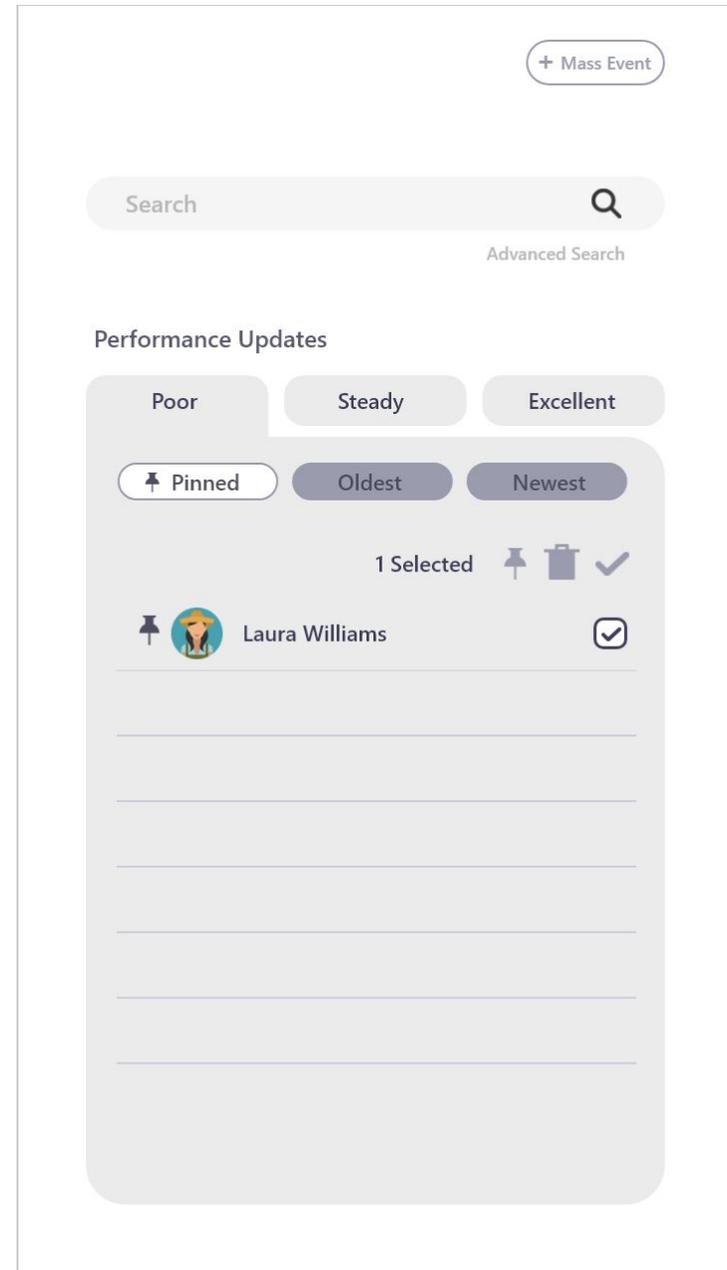
- Number of individuals selected
- Group Pin or Unpin
- Discard
- Complete

2.5.2 Functionality

- Hidden Menu
 - Text (displays the number of items selected)
 - Pin and Unpin (button)
 - Discard Button
 - Complete Button
- 2 visual states for the pin icon beside each user (fill or unfilled)
- Each user will have an checkmarked box

2.5.3 Critical Components

- Filled and Unfilled Pins Icons
- Empty Box (no fill), Filled Box with Checkmark Icon



2.6 Homepage - Performance Updates - Quick Actions

2.6.1 Intention

This window is opened when an long press (hold) on a users profile occurs. A menu appears where the ASD facilitator can do a couple of quick actions which can quickly link to different pages.

Some useful quick actions can include:

- Thumbs up - student receives a thumbs up notification
- Send skill points - facilitator can send skill points to user
- Message - links to [message window](#) between the student and facilitator
- Grades - opens the [grades window](#) of the user

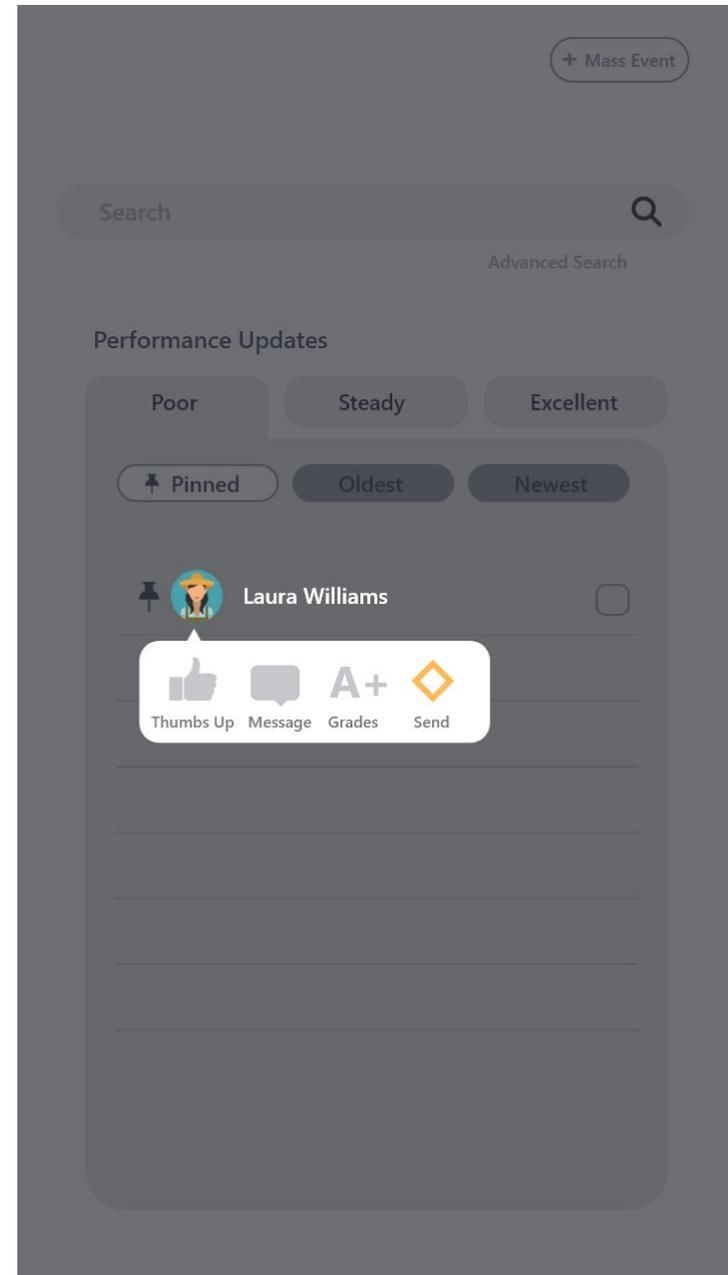
Once a facilitator has done a quick action, the name and profile gets cleared from the list, unless it is pinned by the user.

2.6.2 Functionality

- Long press on students profile in the performance update tab enables quick actions window
- Quick Action Buttons
 - Send popup notifications
 - Link the facilitator to different parts of the app

2.6.3 Critical Components

- Quick Action Icons (to be determined)



2.7 Homepage - Mass Event

2.7.1 Intention

The facilitator enters this window when tapping the “+ Mass Event Button”. This window allows the ASD facilitator to craft a custom push notification out to the ASD students using the app. It can be useful to let students be aware of events, social gatherings, or important news.

Important Points:

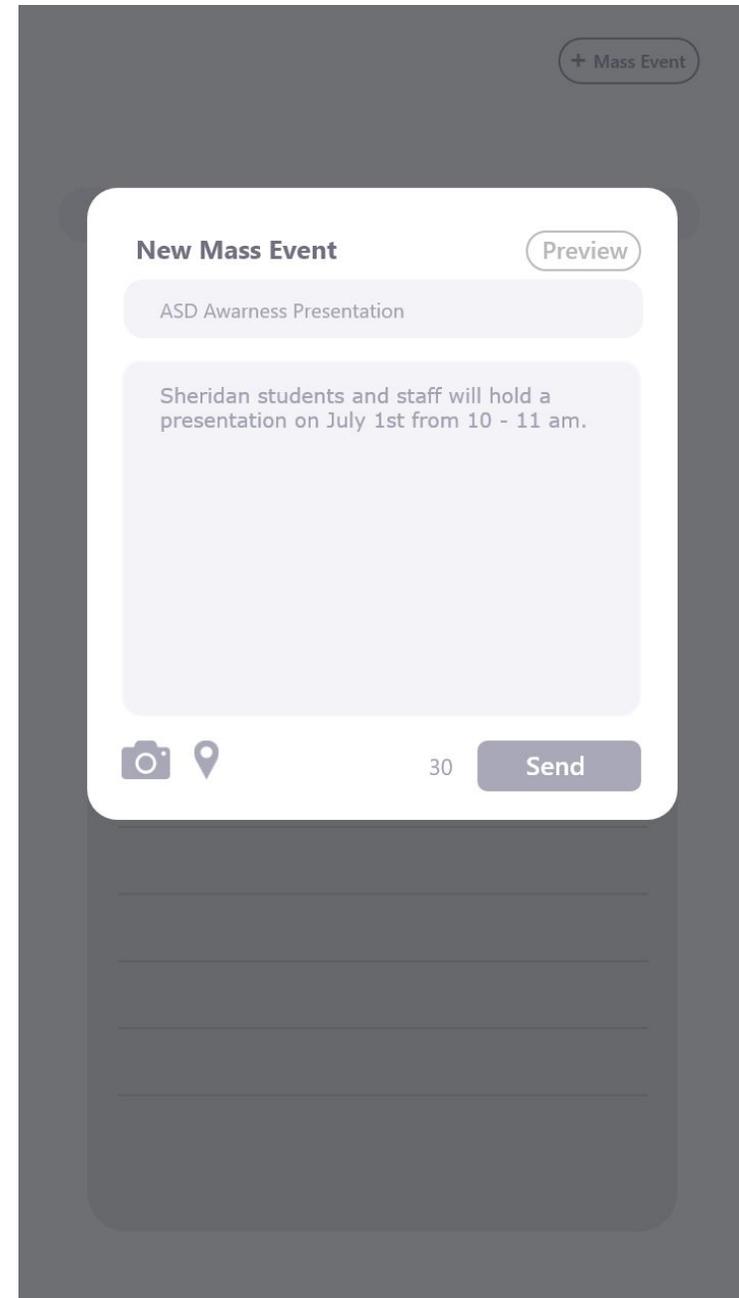
- There is a character limit on the mass event.
- The user is able to tag a location and picture to the message
- The user is able to [preview the mass event message](#)

2.7.2 Functionality

- Buttons
 - Camera
 - Location
 - Preview
 - Send
- Text Fields
 - Header
 - Description/Body
- Character limit counter

2.7.3 Critical Components

- Camera Icon
- Location Icon



2.8 Homepage - Preview Mass Event

2.8.1 Intention

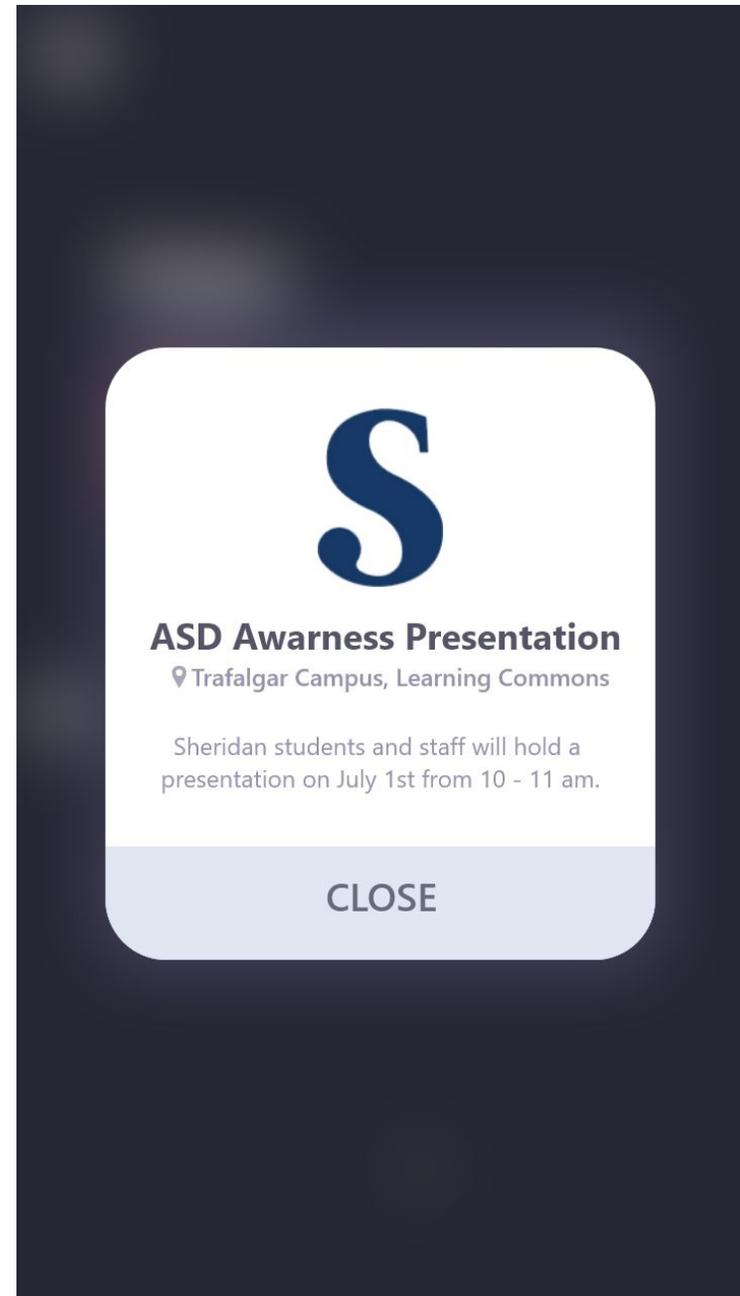
This popup window appears when the user wants to preview a mass event message that they have created. It is opened when the preview button is hit on the [Homepage - Mass Event](#).

2.8.2 Functionality

- Close Button
 - Links user back to [Homepage - Mass Event](#)

2.8.3 Critical Components

- None



2.9 Navigation Window

2.9.1 Intention

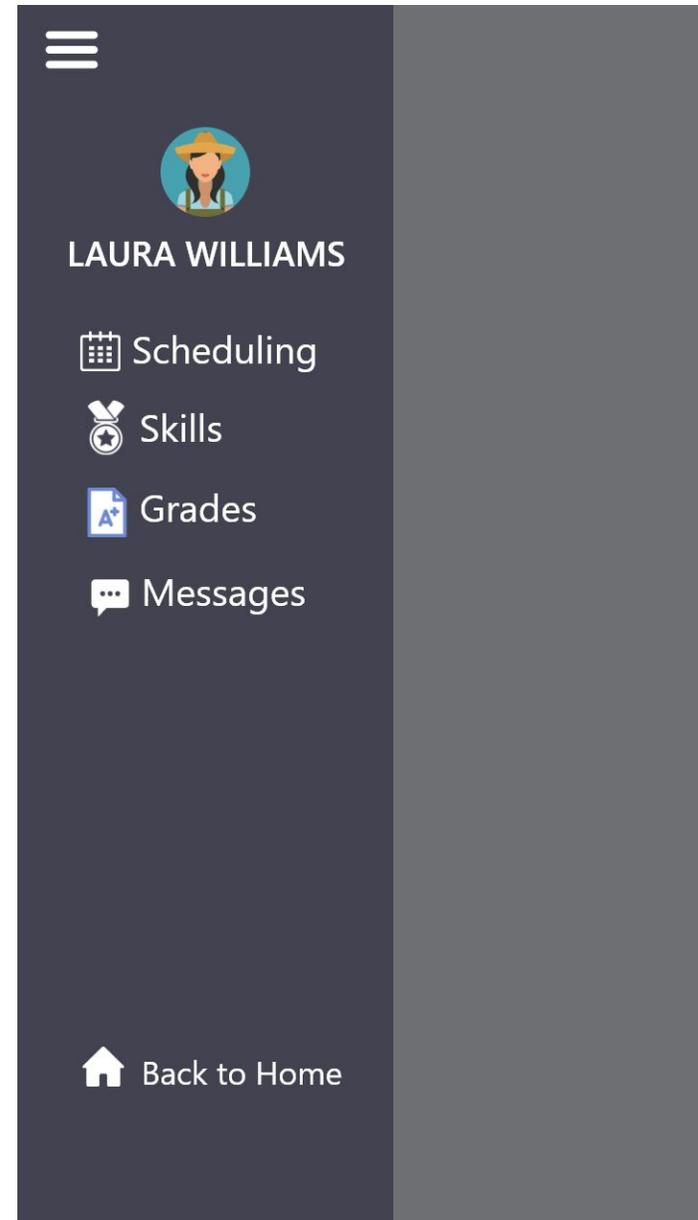
This window will be used to navigate through a students file.

2.9.2 Functionality

- [Uses [Navigation Button](#)]
 - If navigation button is tapped on this window, the navigation window will close
- This window is opened when an icon is pressed.
- There are different icons that the user can click to access different things on the students file (i.e. grades).
- Back to Home Button
 - Brings users back to [Homepage](#)

2.9.3 Critical Components

- Icons to distinguish different sections of the app



2.10 Scheduling Window - Daily View

2.10.1 Intention

The ASD facilitator is able to view a student daily schedule, and at a glance, can see if they are completing their tasks. In addition, each day has button that allows the facilitator to [create a new event](#).

The ASD facilitator knows when the student has completed a task because a check mark and done text will appear beside the event. Events that are not completed will have no check marks.

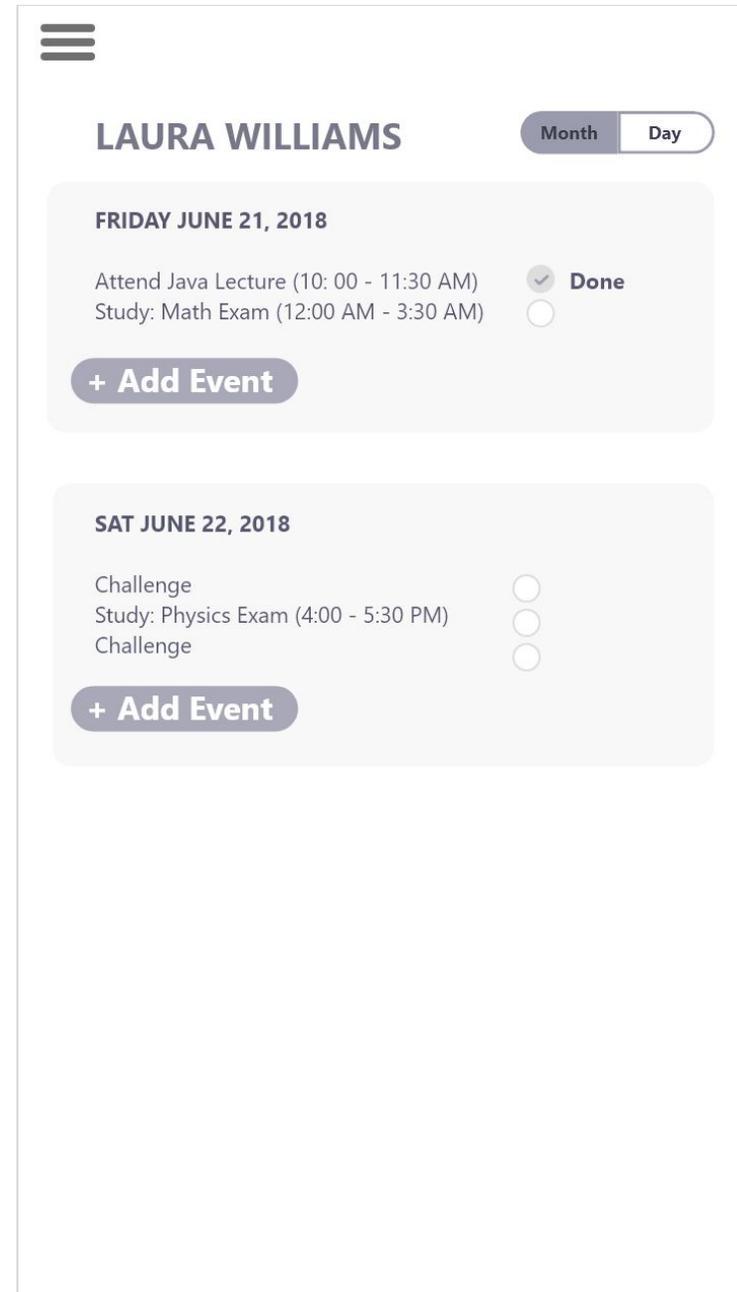
The ASD facilitator is also able to create events on a students calendar, by clicking the [Add Event Button](#).

2.10.2 Functionality

- [Uses [Navigation Button](#)]
- [Uses [Toggle](#)]
 - Daily View
 - Monthly View
- Scroll through different tasks to do
- Add event button
 - Allows facilitator to create a new event

2.10.3 Critical Components

- None



2.11 Scheduling Window - Monthly View

2.11.1 Intention

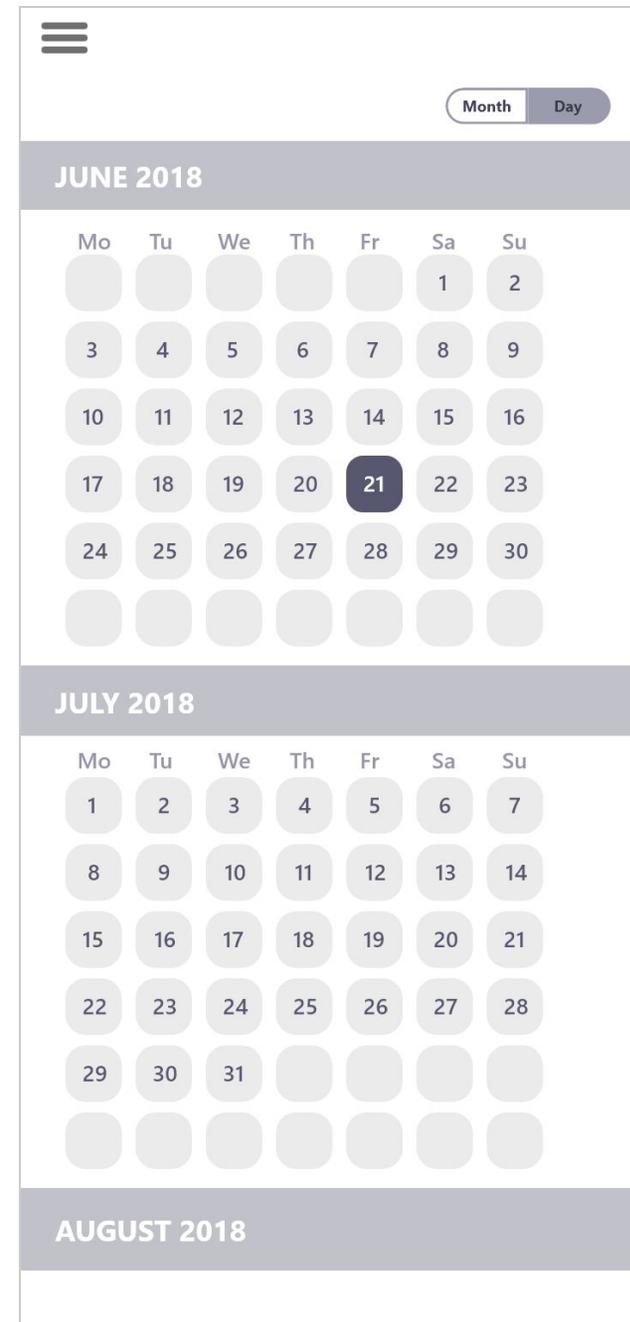
The facilitator will be able to view the calendar in a monthly view, but this is meant to be a tool for navigating across the months. Once a date is clicked on the calendar, it brings up the events on the daily view.

2.11.2 Functionality

- [Uses [Navigation Button](#)]
- [Uses [Toggle](#)]
- Scroll through different months on the calendar
- Tap on a date, to bring up the schedule on the daily view
- Current date is highlighted with a darker colour
- Toggle
 - Switches between Month and Day

2.11.3 Critical Components

- None



2.12 Scheduling Window - Create Event

2.12.1 Intention

This window is opened if the + Add Event button is clicked on the daily calendar. In this window, the user is able to manually input a name, set the date and image for an event.

For more customizability, an additional options button is added, where the user can set if it is repeating, location tags, etc.

2.12.2 Functionality

- Cancel Button
- Create Button
- Camera Icon
 - If the user presses the empty circular window, it brings up the [Select Image Window](#)
- 2 Input Field Categories
 - Start
 - Date and Time
 - End
 - Date and Time
- Additional Options Button

2.12.3 Critical Components

- None

The screenshot shows a mobile application window for creating an event. At the top left, there are three vertical dots. At the top right, there is a circular icon containing a camera and a circular close button with an 'X'. Below the header is a large rounded rectangular input field labeled 'New Event'. Underneath, there are two sections: 'Start' and 'End'. Each section contains two rounded rectangular input fields. The 'Start' section has 'June 21, 2018' and '5:30 PM'. The 'End' section has 'June 21, 2018' and '6:30 PM'. At the bottom of the window is a large, dark rounded rectangular button labeled 'CREATE'.

2.13 Scheduling Window - Create Event - Input Data Popup

2.13.1 Intention

If one of the input fields for the time and date are selected in the [create event window](#), a popup will appear that will allow the user to edit the pre existing values. There are two types of popups:

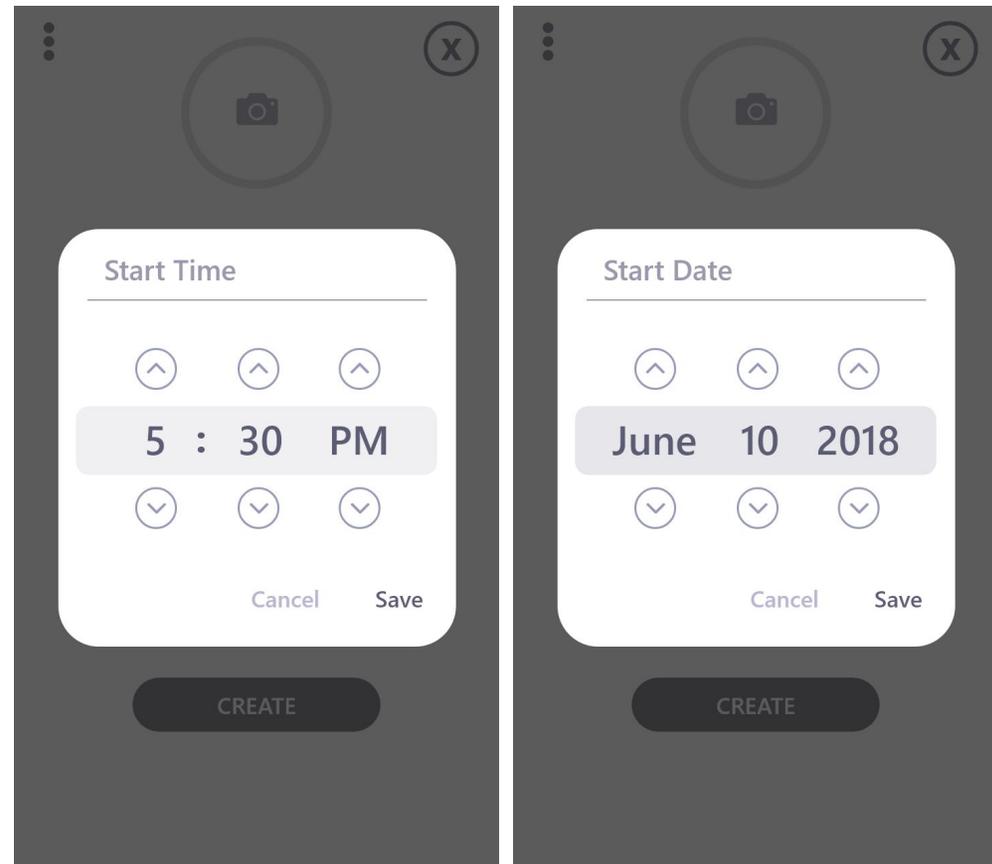
- Edit Date
- Edit Time

2.13.2 Functionality

- Header
 - Describes what type of popup (i.e. Start Time)
- Cancel Button
- Save Button
- If Date Popup
 - 3 Slider Buttons
 - Month, Day, Year
- If Time Popup
 - 3 Slider Buttons
 - Hour, Minute, AM/PM

2.13.3 Critical Components

- None



2.14 Scheduling Window - Create Event - Select Image

2.14.1 Intention

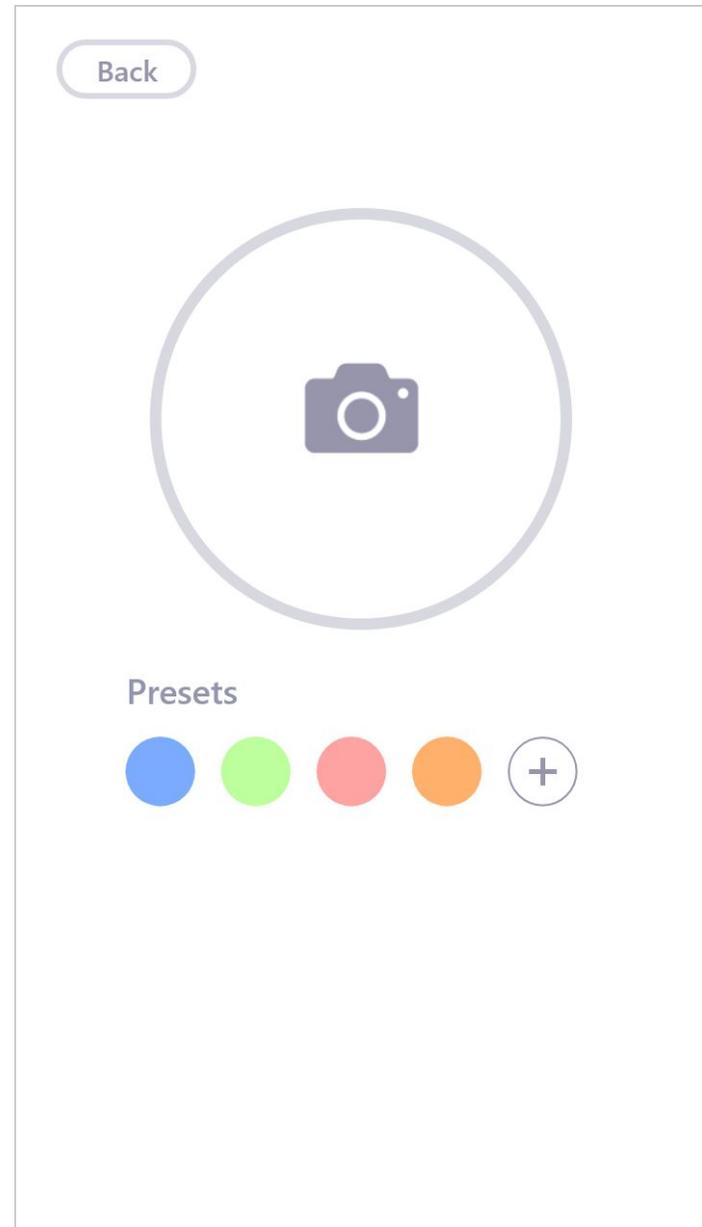
This window is opened when the empty camera icon is clicked from the date or time screen when creating an event. The user is able to set the image of the event with a color, image, or other preset.

2.14.2 Functionality

- Back Button
 - Takes the user back to the previous screen visited.
- Presets Section
 - The user is able to click on preset images and set them as the image for the event

2.14.3 Critical Components

- None



2.15 Skills

2.15.1 Intention

The facilitator is able to receive and view data on how a student is using the app. Some of the information being displayed include:

- Social Communication Skills
- Recently Played Challenges

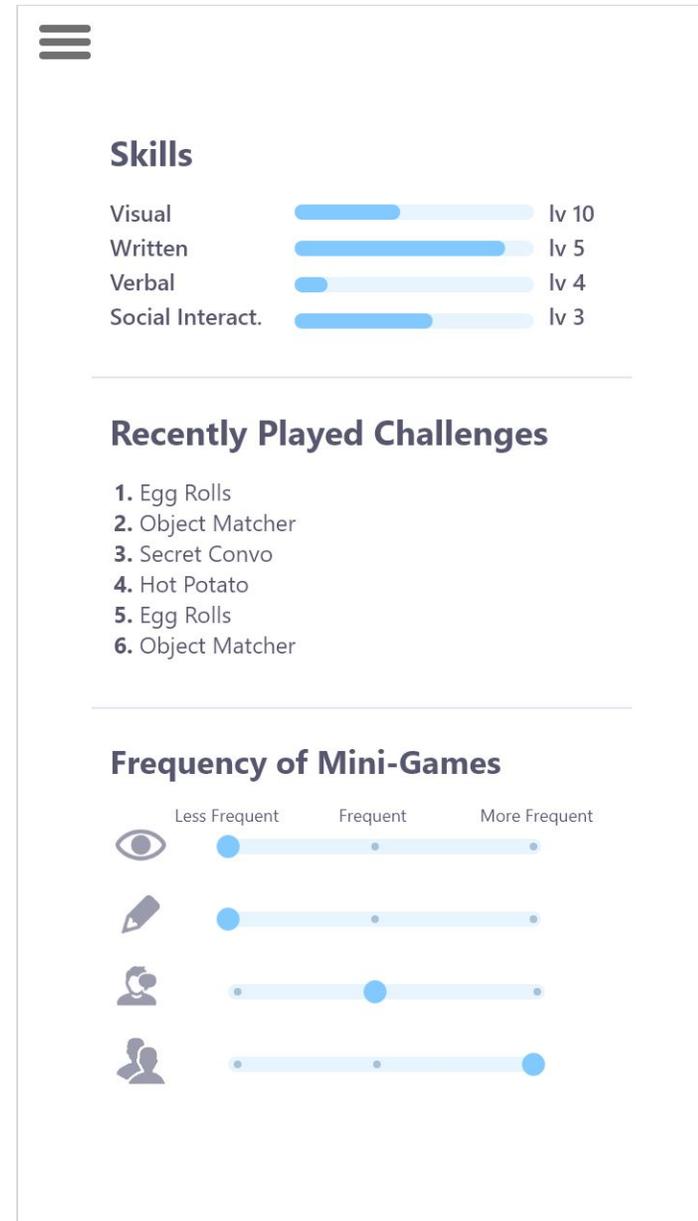
The ASD facilitator also has the **option to increase the frequency of mini-games** found in each of the social communication categories. If the user slides the notched bar on a particular category, it can show up more often compared to the rest.

2.15.2 Functionality

- [Uses [Navigation Button](#)]
- [Uses [Notched Slider](#)] for each social communication skill
 - Points on Slider
 - Less Frequent
 - Frequent
 - More Frequent

2.15.3 Critical Components

- Interactable Notched Slider
- Progress Bar



2.16 Grades - Shortened Display

2.16.1 Intention

The window showcases the grade report of a student, displaying assignments graded, etc. In the grades window, the user sees a progress bar in which two variables are compared:

- Target Grade (Left)
- Current Grade (Right)

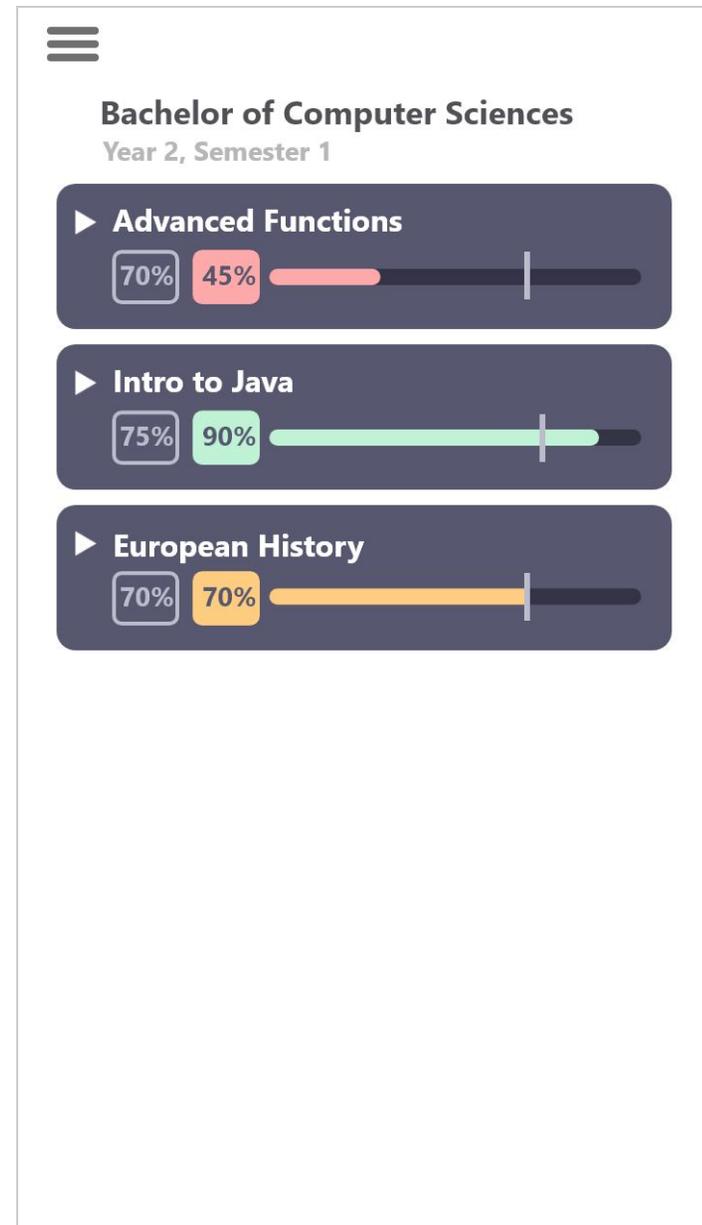
The target grade is indicated on the progress bar through a solid grey line. The coloured bar represents the current average grade. Using these two variables, the ASD facilitator can easily define and understand the relationship between these two variables.

2.16.2 Functionality

- [Uses [Navigation Button](#)]
- Each class is categorized
 - Name of Program
 - Year
 - Semester
 - Class Information
 - Name of Course
 - Target and Current Average Grade (displayed by progress bar)
 - List of Grades

2.16.3 Critical Components

- None



2.17 Grades - Expanded View

2.17.1 Intention

If a user taps on a class, it folds out to give the user more information on students grades on assignments and tests.

Three key pieces of information are provided:

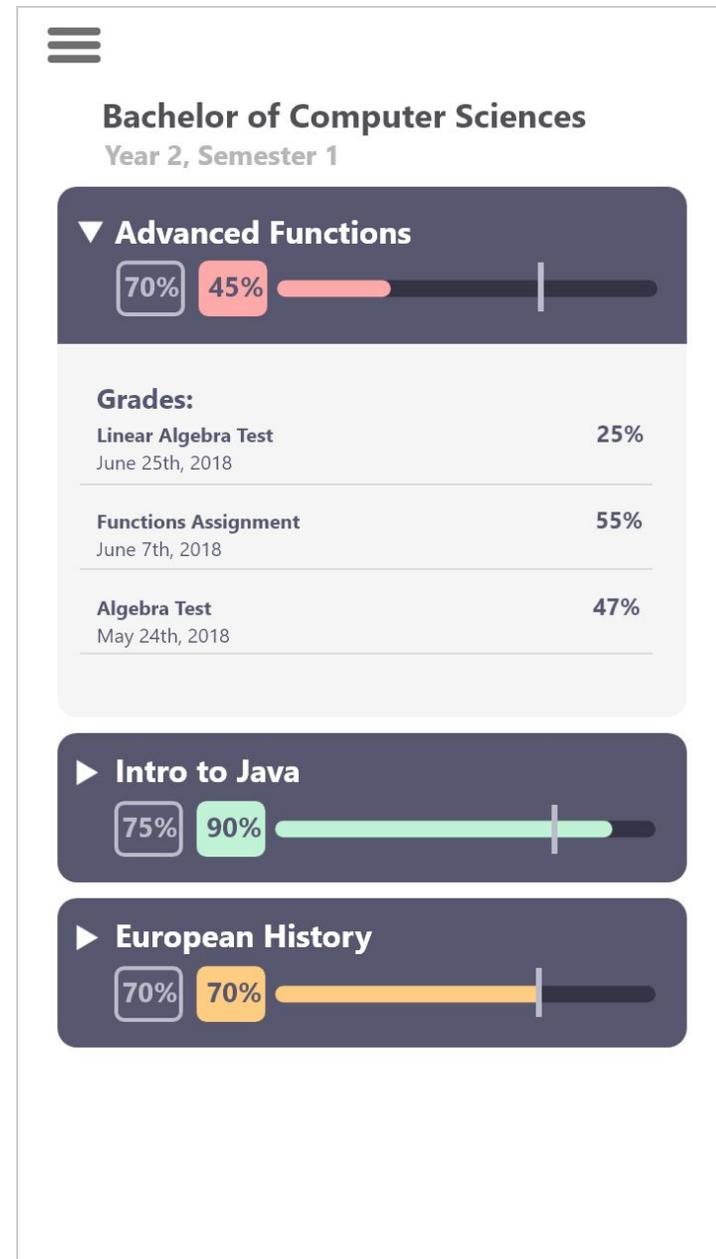
- Name of Assessment
- Percentage
- Date

2.17.2 Functionality

- [Uses [Navigation Button](#)]
- Dropdown
- Rotatable Arrow Icon

2.17.3 Critical Components

- None



2.18 Messaging

2.18.1 Intention

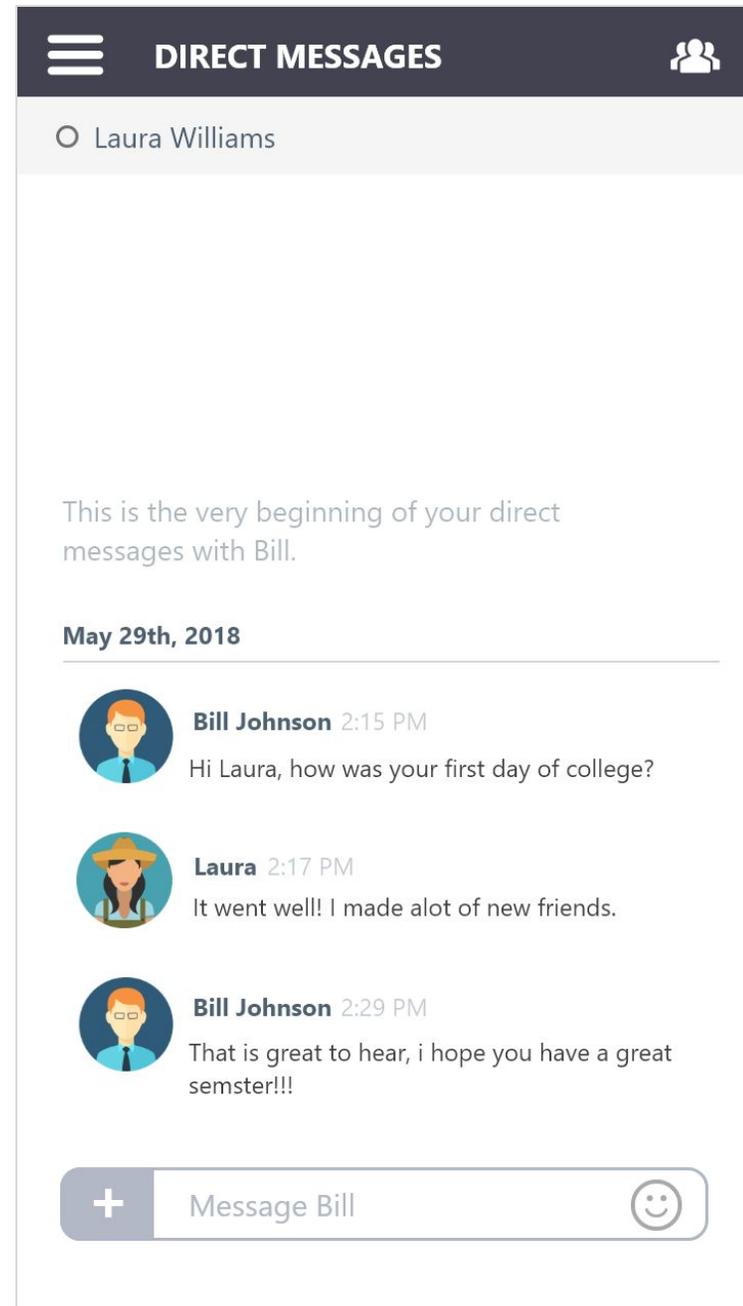
This allows the ASD facilitator to send messages and multimedia files to students.

2.18.2 Functionality

- [Uses [Navigation Button](#)]
- Networking

2.18.3 Critical Components

- None



3.0 Common Systems

A list of systems, assets and functionality that are used multiple times throughout the application.

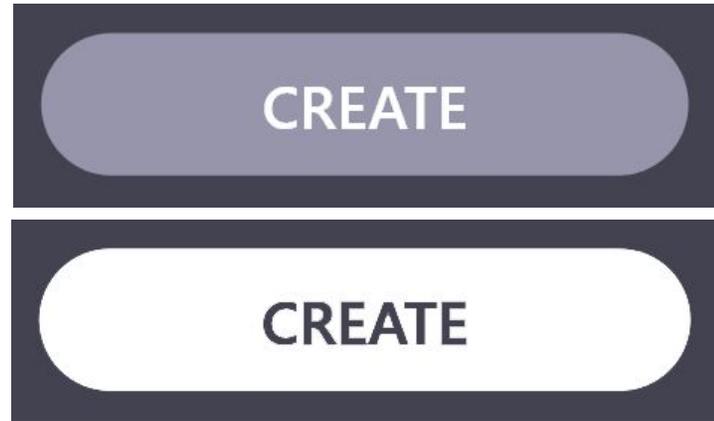
3.1 Button Press

3.1.1 Code

- Depresses (feedback) when tapped
- Calls a function to do something

3.1.2 Art

- Long rectangle button
- Medium Rectangle button
- Bar Fill
- Bar Background



3.2 Navigation Button

3.2.1 Code

- If the button is pressed it overlays the screen with the navigation window
- Slide-In
- Darkens the background (blur effect)

3.2.2 Art

- Custom Icon



3.3 Toggle

3.3.1 Code

- Two or more different variables that the user can control
- Only one variable can be selected, (i.e. On/Off Switch)



3.3.2 Art

- Two or more buttons
- Dark Fill (selected) and Light Fill (unselected)

3.4 Notched Slider

3.4.1 Code

- Small Nodes are placed on the progress bar
- The user can slide the circle to move it along the notched points
- Sets a value or frequency



3.4.2 Art

- Bar
- Notches (Circles)
- Interactable Circle (Slider)



Motify

Art and Style Guide

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1.0 User Interface

1.1 Buttons

1.1.1 Rectangular Button

- Long rectangular shapes with rounded corners
- Text Center Aligned

1.1.1.1 Interaction

- The button changes colour when the user taps it (inverting the colours)

Normal



Pressed

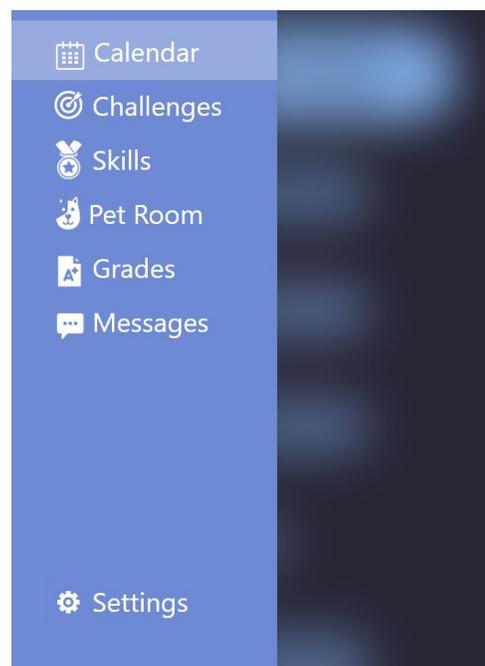
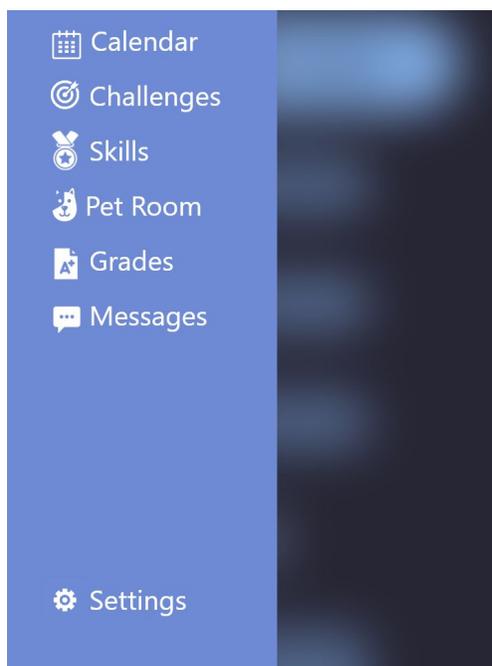


1.1.2 Text Button

- The button has no exterior shape
- Usually composed of either just text or text with an icon (placed on the left side)

1.1.2.1 Interaction

- A hidden rectangle can appear, indicating which item you have selected
- The rectangles colour is lightened



1.1.3 Icon Button

- The button has a custom icon

1.1.3.1 Interaction

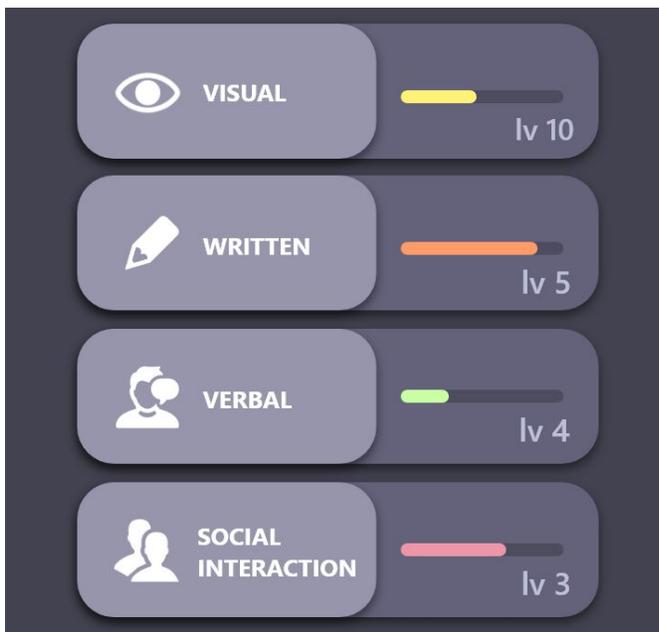
- When the icon is pressed, the icon darkens.
- A circular pulse appears overtop of the button pressed which provides visual feedback to the user, indicating that it was pressed



1.2 Sliders/Progress Bar

1.2.1 Standard Progress Bar

- Flat Color
- Rounded Corners
- Flat Unfilled Area
- No Outlines



1.2.2 Radial Bar

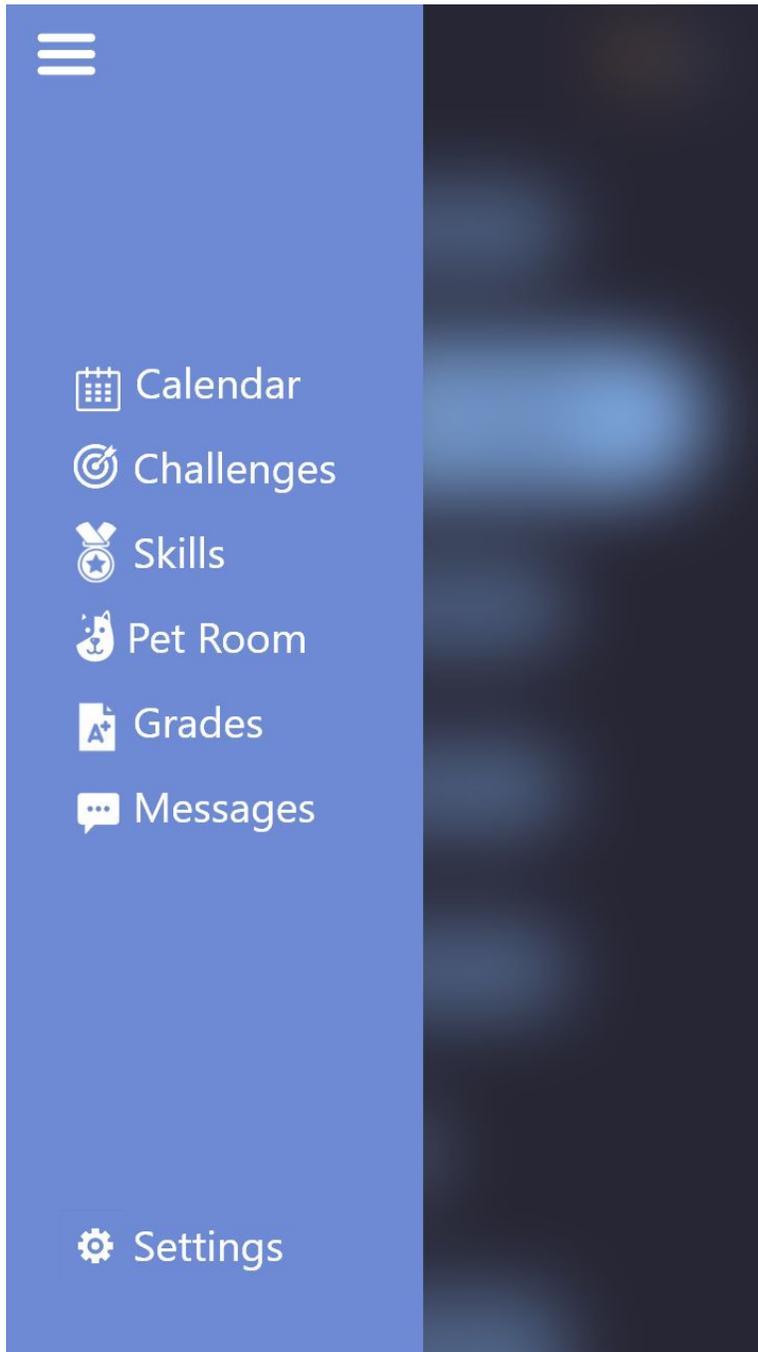
- Flat Colour (light colour fill, dark colour fill)
- Starting point of the radial bar is shown with a circle
- White outline in unfilled area



1.3 Navigation Bar

The navigation bar (accessed through the top left).

- Flat Coloured Bar
- Icons on bar gets highlighted if a user hits the icon and the user is on that page



1.4 Icons

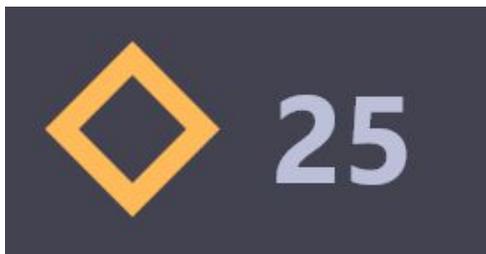
1.4.1 General Icons

- Rounded shape language
- Flat colours



1.4.2 Currency (Skill Points)

- Distinct sharp shape language
- Strong flat colour that accents the current colour scheme



1.4.3 Shop Items

- General inspiration and style of accessories that can be purchased for the pet
- The icons consist of flat colours, with slight outlines around each item.
- Rounded shape Language to fit into the cute aesthetic

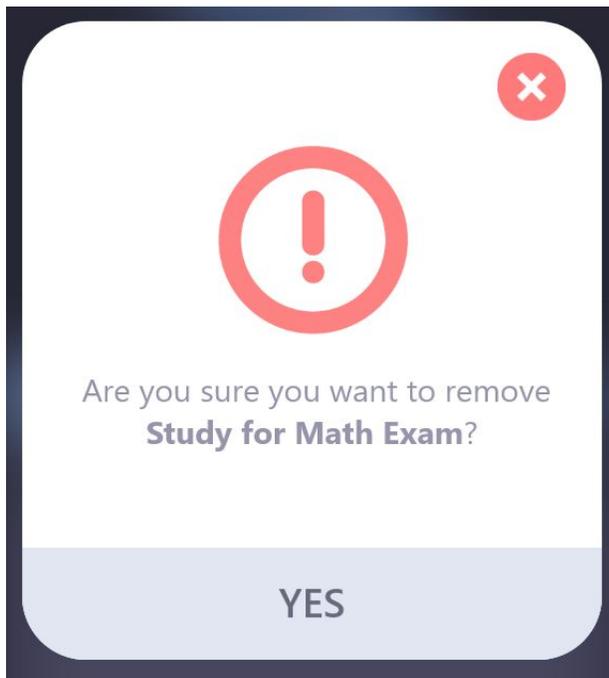


1.7 Popup or Overlaid Windows

1.7.1 Example 1: General Notification (Pop-Up Message)

1.7.1.1 Key Components

- Custom image
- Custom Text Description
- Cancel Button (X symbol) - Highlighted to be a different colour, so it seems interactable
- Button (performs a certain action)
- Size Ratio
 - 80 percent displays user with relevant information (image, text, etc)
 - 20 percent (bottom) display utilized so the user can make an action (accept, cancel, etc).

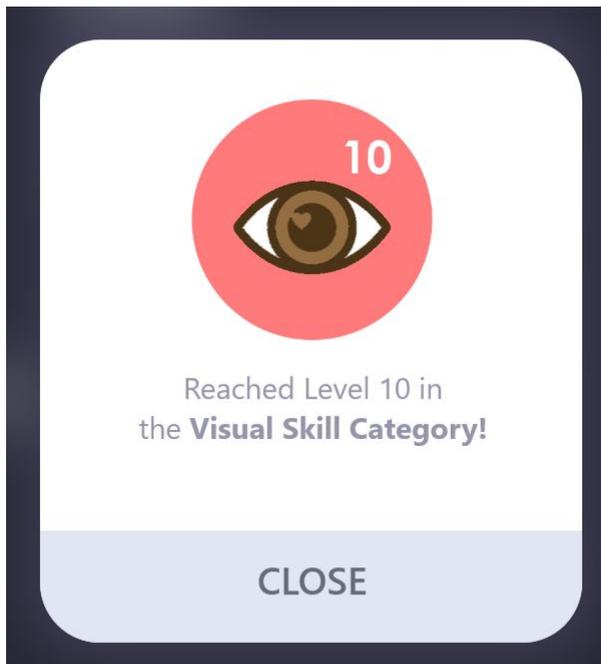


1.7.2 Example 2: Badges

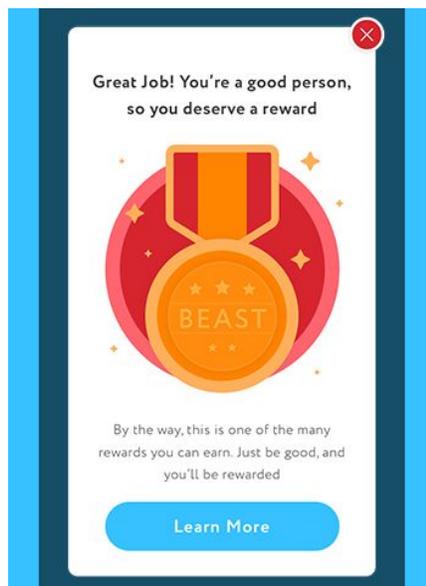
1.7.2.1 Key Components:

- Badge is encompassed in a circle
- Short Text Description
- Distinct Button (different colour to separate it from the badges panel)

1.7.2.2 Prototyped



1.7.2.3 Reference



1.6 Panels

- Consist of being flat, solid colours

1.6.1 Multi-Tab Panels

- When a user clicks a tab it connects with the panel below, making it easier and visual clear what information your viewing and what tab it is on
- Multi-Tab windows are organized horizontally, so it is easy to flip back and forth

1.6.1.1 Prototyped



1.6.1.2 References



Source: *Pokemon Quest*

2.0 Layout Guidelines

2.1 Adobe XD Project Dimensions

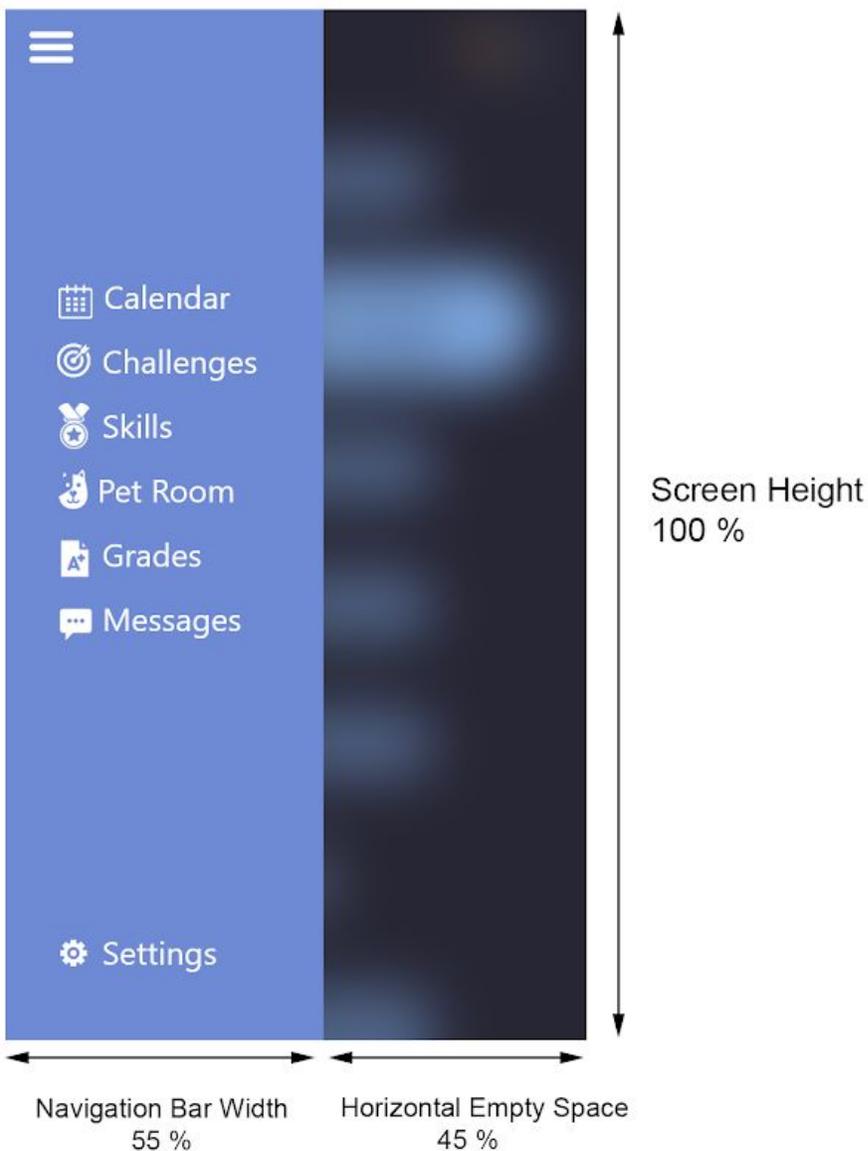
The Adobe XD prototype was built using Standard Android Screen with the dimensions being 360 x 640 px .

2.2 Navigation Bar

- 55% of the screen real estate
- 45% is left for the user to return to the screen visited

2.2.1 Intention

The 45 percent of empty space allows the user to close the navigation bar with ease, when returning to the screen that they were previously on.

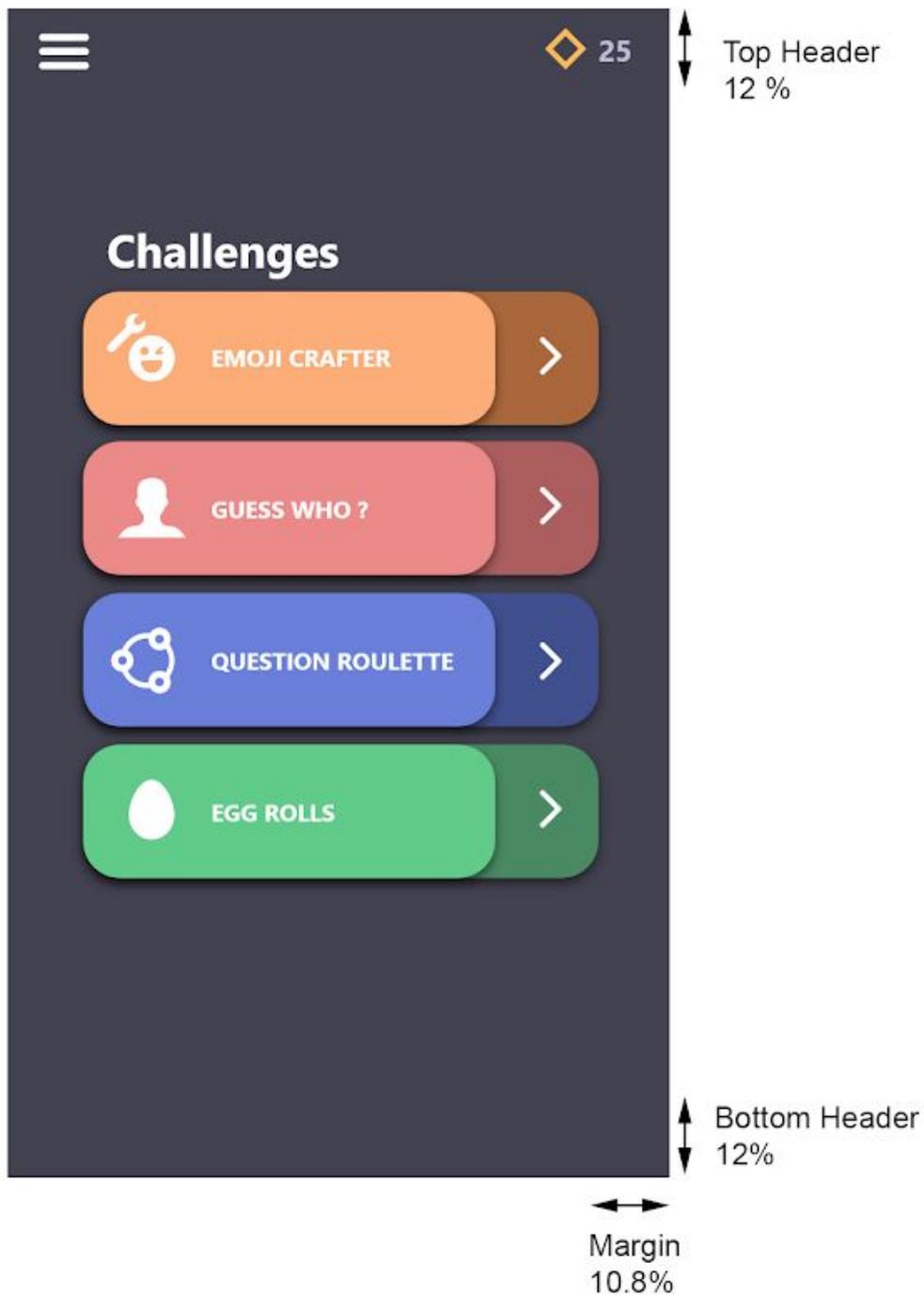


2.3 On Screen Content

2.3.1 Intention

2.3.1.1 One Screen

The screen real estate for onscreen content varies with different screens, but it is generally requires 10.8% percent for horizontal and 12 % percent for vertical padding.

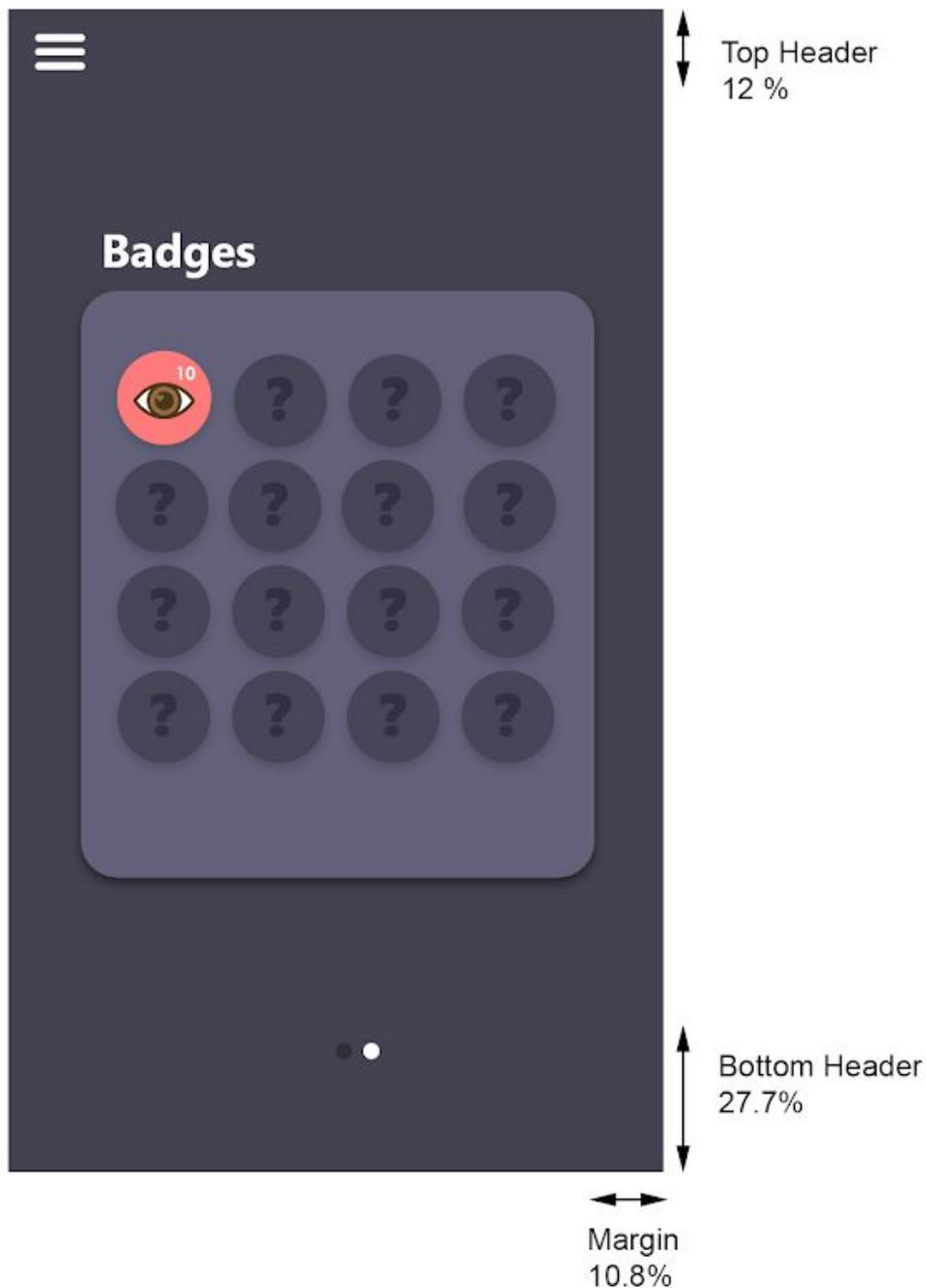


2.3.1.2 Multiple Screens (Slide Back and Forth)

The screen space for the horizontal margin takes roughly 10.8% of screen real estate. This allows the user to easily swipe or tap between screens back and forth. This type of screen also requires 27% of space at the bottom for a header which shows what page the user is on.

In both cases, most content is center aligned. It usually requires:

- Top header (used for important info, navigation)
- Horizontal Padding

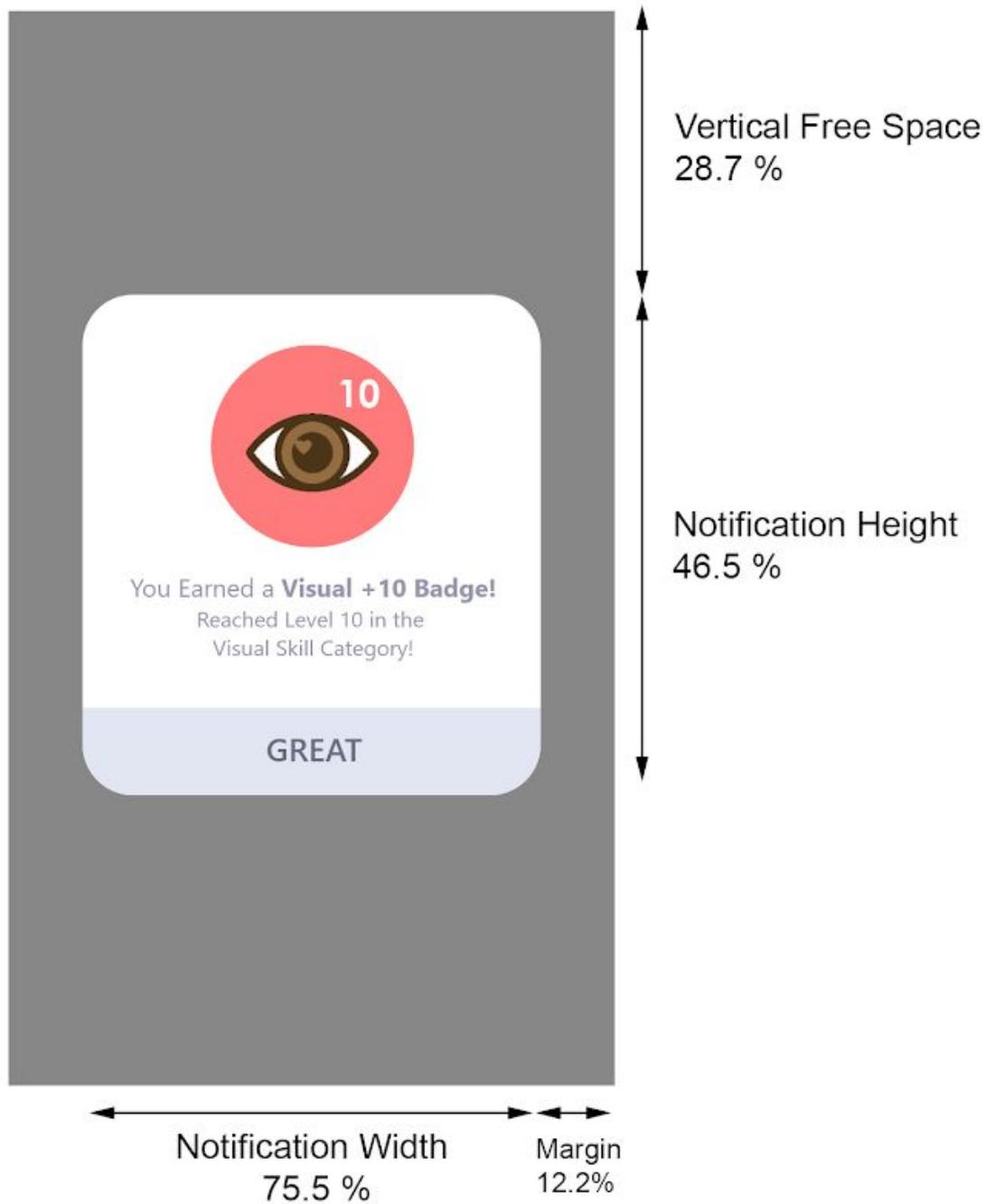


2.4 Overlaid Content

I.e. Notification, Pop Up Windows

2.4.1 Intention

There are large free spaces below and above the notification, so it is easy for the user to tap out of the pop-up and return to the screen that they were visiting.



3.0 Character/Pet Design

To appeal to a broader audience, the pets will be designed to encompass a cute aesthetic. The pet design will revolve around having simple dynamic shapes and colourful designs.



Source: Pokemon



Source: Pokemon GO

4.0 Font

The Motify Calendar app and the ASD facilitator view will both use **Segoe UI font**. It is a Microsoft font that is very legible and easy to read, and provides a variety of different line weights to choose from.

Title	Segoe UI
Heading	Segoe UI
Subheading	Segoe UI
Body	Segoe UI
Button	SEGOE UI (ALL CAPS)

5.0 Color

Color is used to:

- Highlight and organize key information (i.e. Grades Window)
- Defining what is and is not interactable within the app
- Giving the user feedback that an action was inputted (i.e. highlighting a multiple choice answer)

5.1 Color Schemes

Two slightly different color schemes were developed to encompass the two target users that will be using Motify.

5.1.1 Motify Calendar (Student View)



Hex #434250



Hex #63627A



Hex #9695AC



Hex #9BC6FF



Hex #FFBA59

5.1.2 ASD Facilitator View



Hex #3B3B47



Hex #9B9BAE



Hex #EBEBEC



Hex #81C9FF

5.2 Colour Accessibility

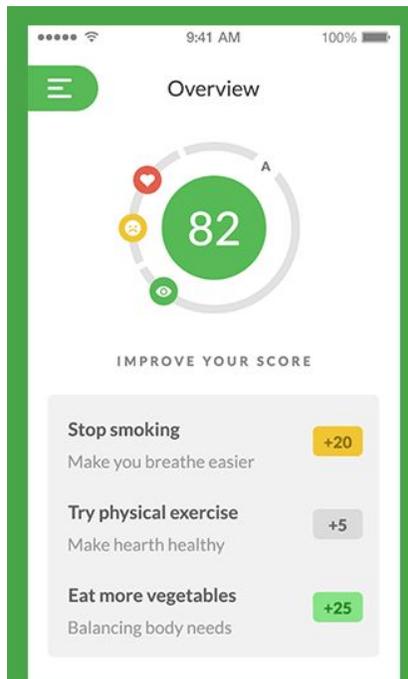
A [study](#) on colour preference for autistic individuals concluded that **sensory overloading colours such as yellow, pink and red should be avoided**. In addition, colors such as blues, greens and browns are proven to be more effective in reducing anxiety and stress among individuals with ASD.



6.0 Animations and Interactions

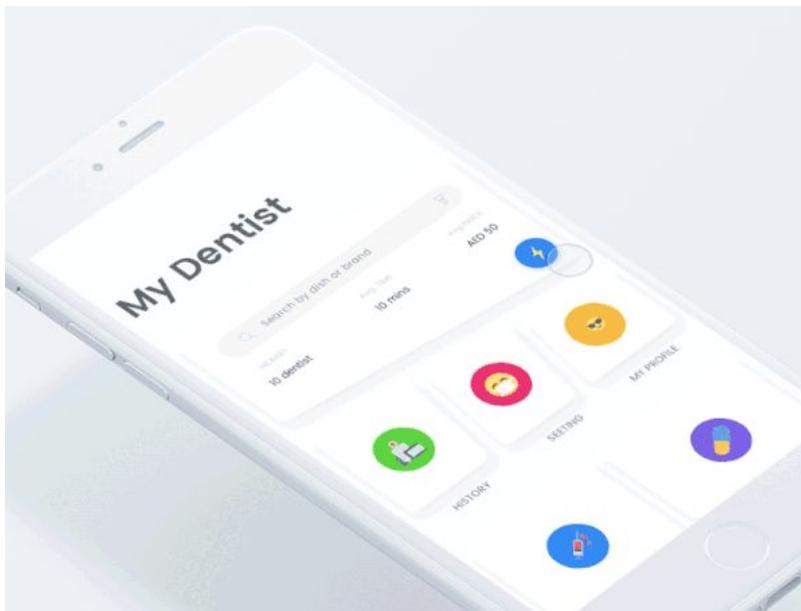
6.1 Navigation Bar

- Example of accessing the navigation window (Slide-In Animation)



6.2 Sample Initialization Screen

- Consists of a slide-in animation, and selected items are visually highlighted



Lawn Mowers: Mini-Game

Technical Design Document

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1.0 Overview

1.1 Goal

Lawn Mowers is a competitive 2 vs 2 lawn mowing game, where players are tasked to cut a patch of grass on a grid efficiently while using as little fuel as possible.

1.2 Game Mechanics and Elements

1.2.1 Core Mechanic

When a player is over an uncut patch of grass, the lawn mower cuts it.

1.2.2 Movement

A player can move in the cardinal directions on the grid. Once the game starts, the lawn mower moves by itself in the direction it is facing. The player can change the direction by using a [virtual d-pad](#). The player is constrained to the grid and cannot leave it (the milling problem).

1.2.3 Timer

There is a finite amount of time that a user can mow the lawn (i.e. 30 seconds to 1 minute).

1.2.4 Fuel

Each player has a finite amount of fuel that they can use to mow the grass

- Moving to a new tile results in the fuel resource being reduced by an amount (i.e. for every tile moved, remove 1 fuel)

1.2.5 Obstacles

If a player hits an obstacle on the path, their lawn mower is unable to function (it breaks down). If both players lawn mowers hit each other, the other team wins automatically.

2.0 Mini-Game Screens

A breakdown of screens to be implemented in the game.

2.1 Start Screen

2.1.1 Intention

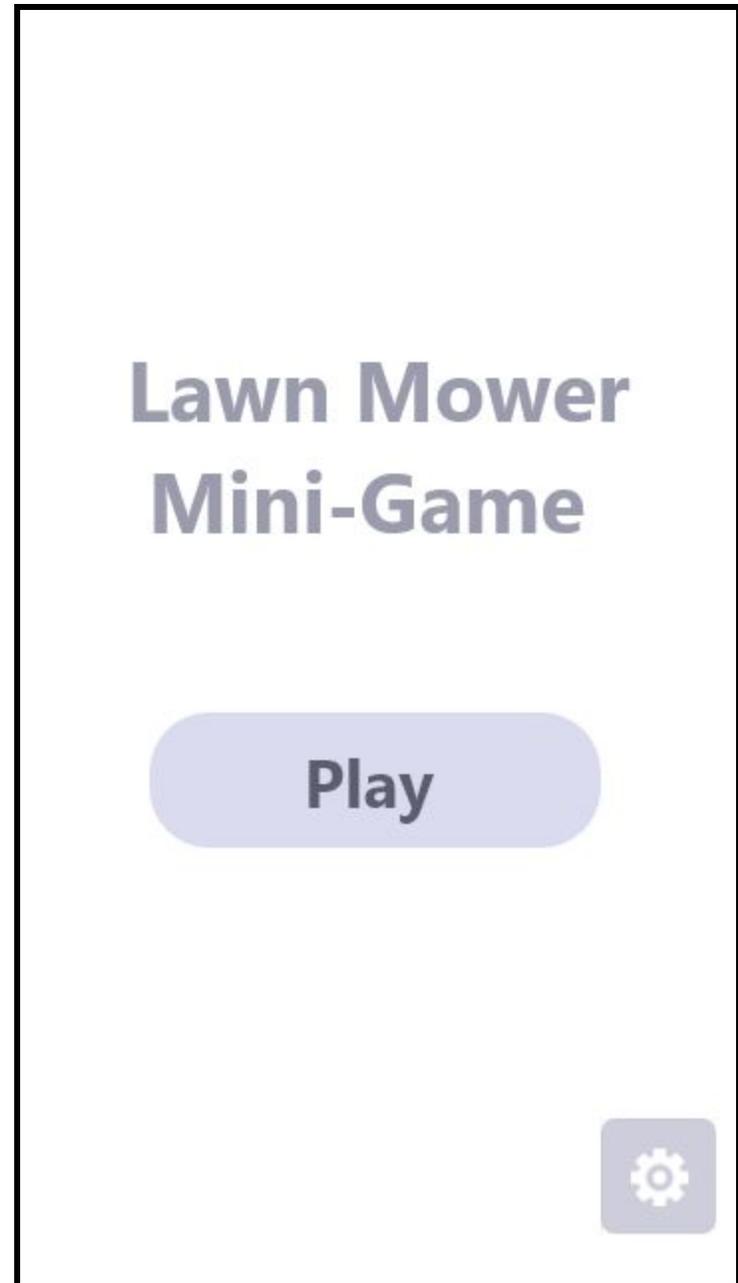
This window allows the user to enter into the mini-game. It also offers the player the opportunity to set up local matchmaking.

2.1.2 Functionality

- Uses [Start Screen](#)

2.1.3 Critical Components

- Play Button



2.2 Finding Teammate Screen

2.2.1 Intention

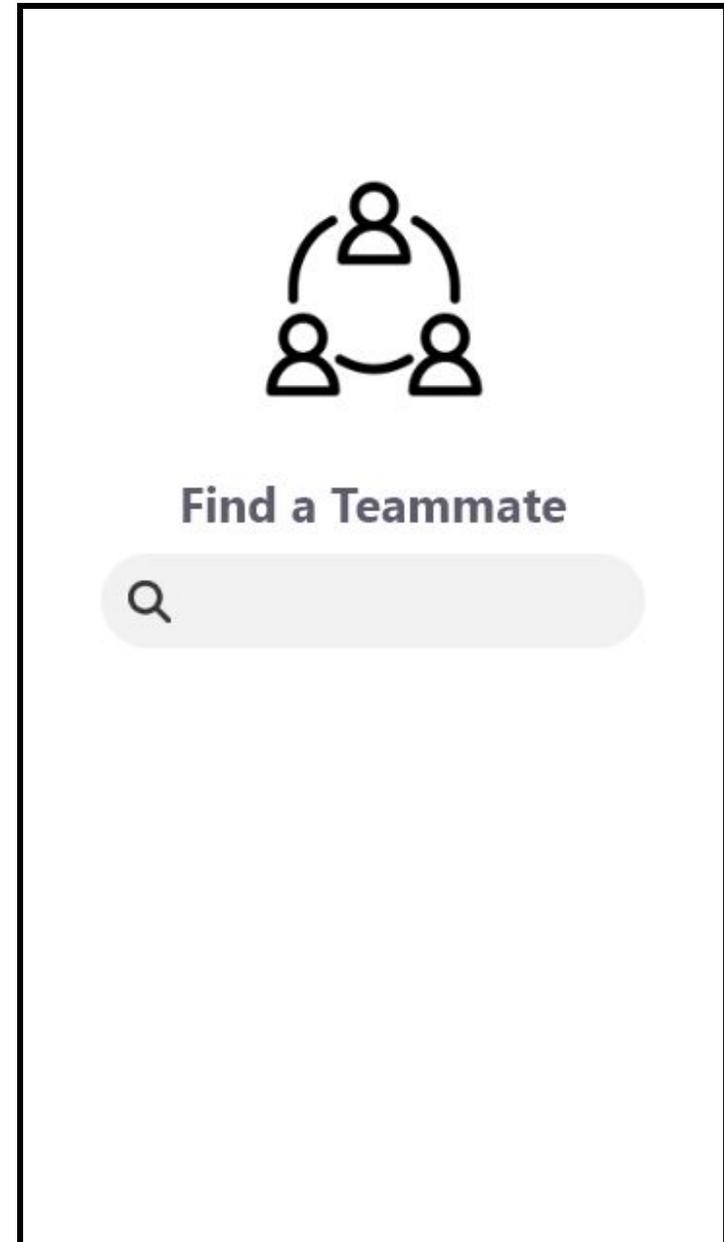
In this screen, the player can invite someone in the ASD database to play the mini-game, by typing in their name into a search bar.

2.2.2 Functionality

- Search Bar
 - User is able to write a name, and have search results appear
- Networking

2.2.3 Critical Components

- None



2.3 Notification - Invite

2.3.1 Intention

The user who has been requested to play a multiplayer mini-game can receive a notification in one of two ways:

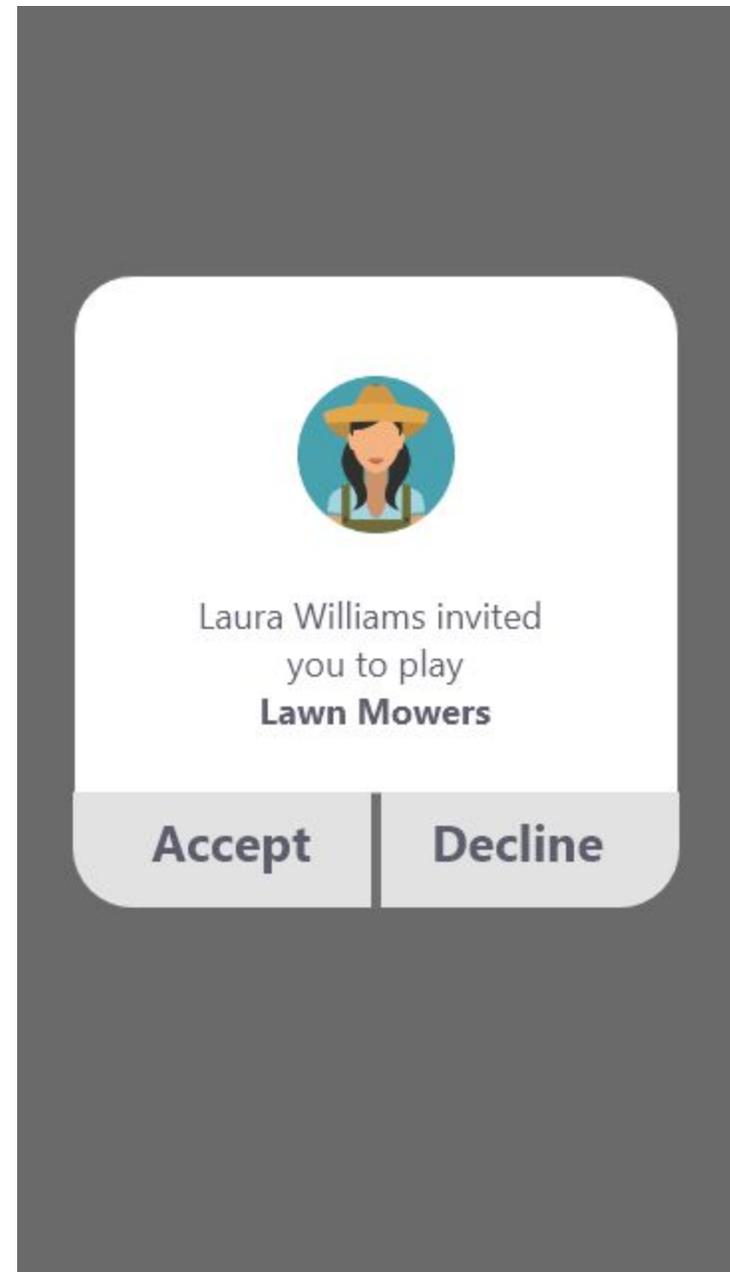
- Push notification
 - This message is displayed on the users phone, if the app is not opened
- Popup notification
 - This is used when the user is browsing or using the app

2.3.2 Functionality

- Popup Notification Button
 - Accept
 - Decline
- Networking

2.3.3 Critical Components

- None



2.4 Gameplay Screen - Basic Components

2.4.1 Intention

When this screen is loaded, the teams have 3 to 5 seconds to view the map, before their lawn mowers start and the game begins.

This screen is split up into three components:

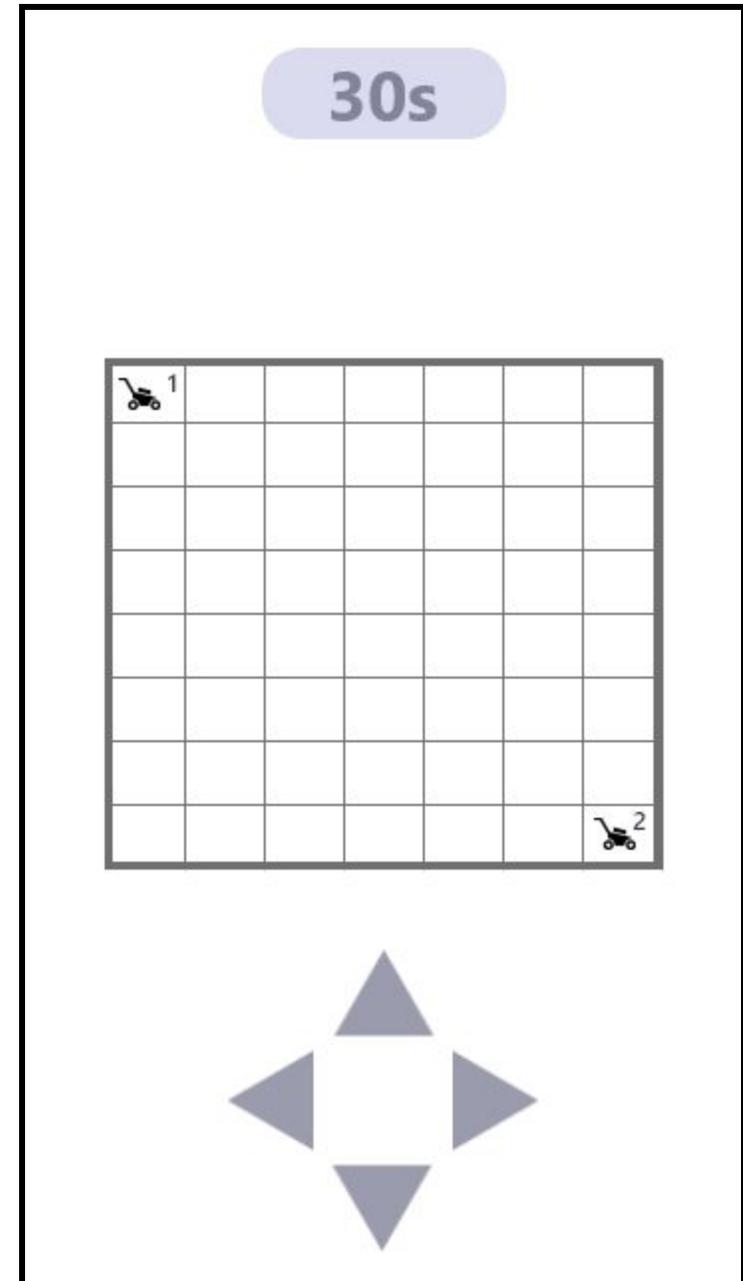
- Timer
- Playspace (or Grid)
- Virtual Input

2.4.2 Functionality

- Color and Name Indicators
 - Displayed over each player in the game
- Timer
 - Incrementally decrease, once it is zero, it brings up the [Winning Screen](#).
- Virtual D-Pad
 - Inputs on the virtual d-pad will change the direction of the lawn mower on the screen

2.4.3 Critical Components

- Timer
- Grid
- Arrow Keys for D-Pad
- Icons for two players



2.5 Gameplay Screen - Level Start

2.5.1 Intention

Each level will consist of having a custom grid layout with the basic elements that includes:

- Cuttable Grass
- Basic Obstacle (Rock or Wall)

In addition, each level will contain [two unique elements](#) (i.e. powerups, different terrain tiles, etc).

Grid Size Requirements:

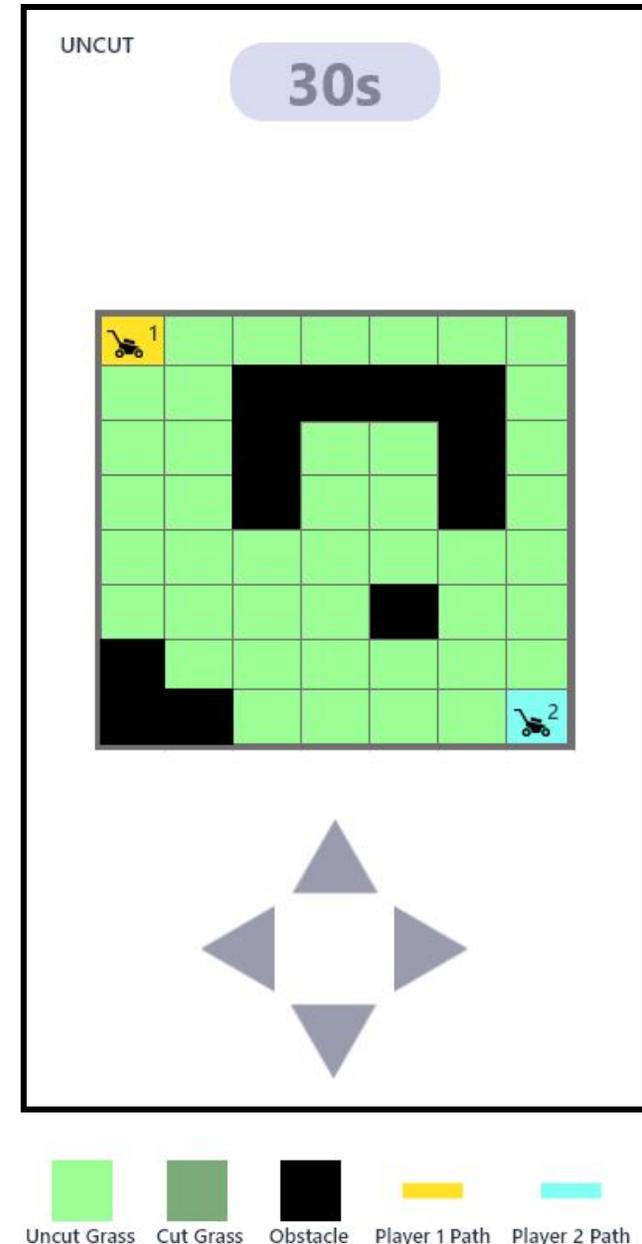
- The timer amount affects how big the grid size should be
 - Average user can finish going around with the given timer amount
- General Range of the Grid
 - Max 11 x 7
 - Min 8 x 7

2.5.2 Functionality

- None

2.5.3 Critical Components

- None



2.6 Gameplay Screen - Level Completed

2.6.1 Intention

Each tile on the grid will consist of two different states:

- Uncut
- Cut

With each state, the visual appearance of the grass will change, indicating to the player that they have performed an action.

A colored line will trail behind the player; this will allow both players to know the direction each other took and where they are progressing to (see image).

The fuel status of each players ui will be [diegetic](#). There will be three states that visually indicate to the user how much fuel is left:

- No Smoke
- Light Smoke Trail
- Heavy Smoke

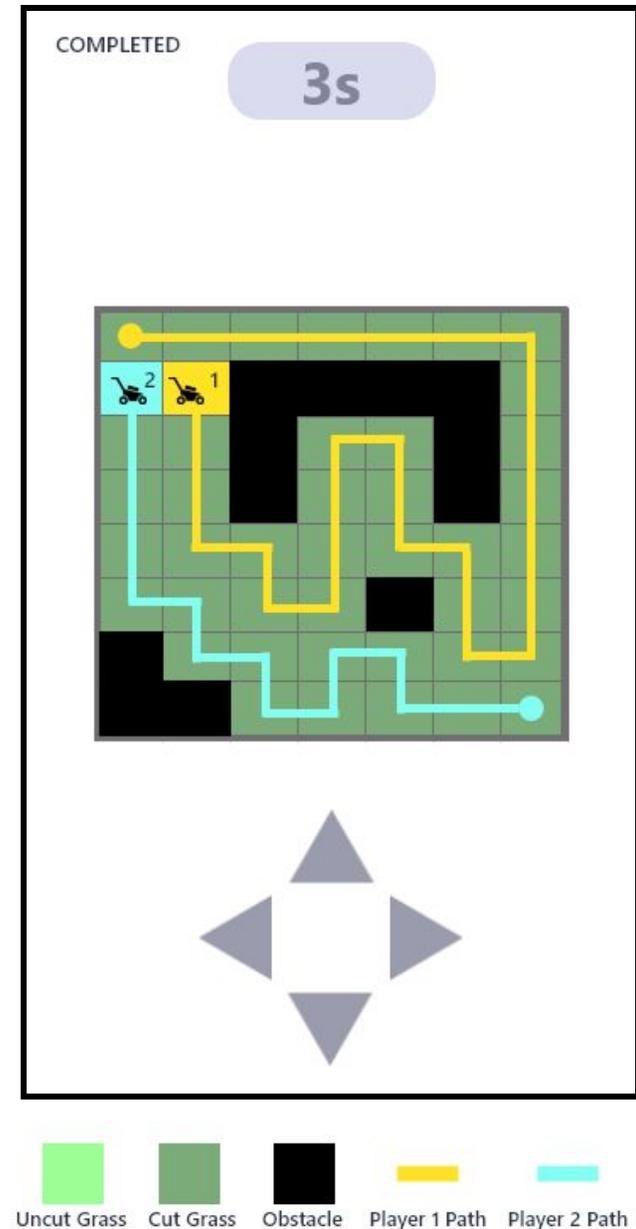
Once the user reaches the third phase, they have a limited time before there lawn mower stops running.

2.6.2 Functionality

- Visual states of each tile

2.6.3 Critical Components

- Grass Tile (Cut and Uncut), Obstacle



2.7 Winning Screen

2.7.1 Intention

This screen is displayed through one of three cases:

Case 1: Timer Runs Out, No One has Finished Cutting the Grass:

If the timer runs out, the “game manager” will determine who cut the most grass, and how much fuel the team has left. Whoever is the most efficient with the amount of grass cut is determined to be the winner.

Case 2: One Team has Finished Cutting the Grass

Case 3: Both Team Members Lose all fuel

In this case, the other team wins. This happens when both team members crash their lawn mowers into obstacles or each other which can cause fuel to be lost. The other way this happens is simply all the fuel is lost while they are traveling.

The screen zooms out, so both teams grass patches are visible, once a winner is decided the camera goes to the winners position, and displays winner icon. In addition, it displays the fuel remaining and percentage of grass cut.

2.7.2 Functionality

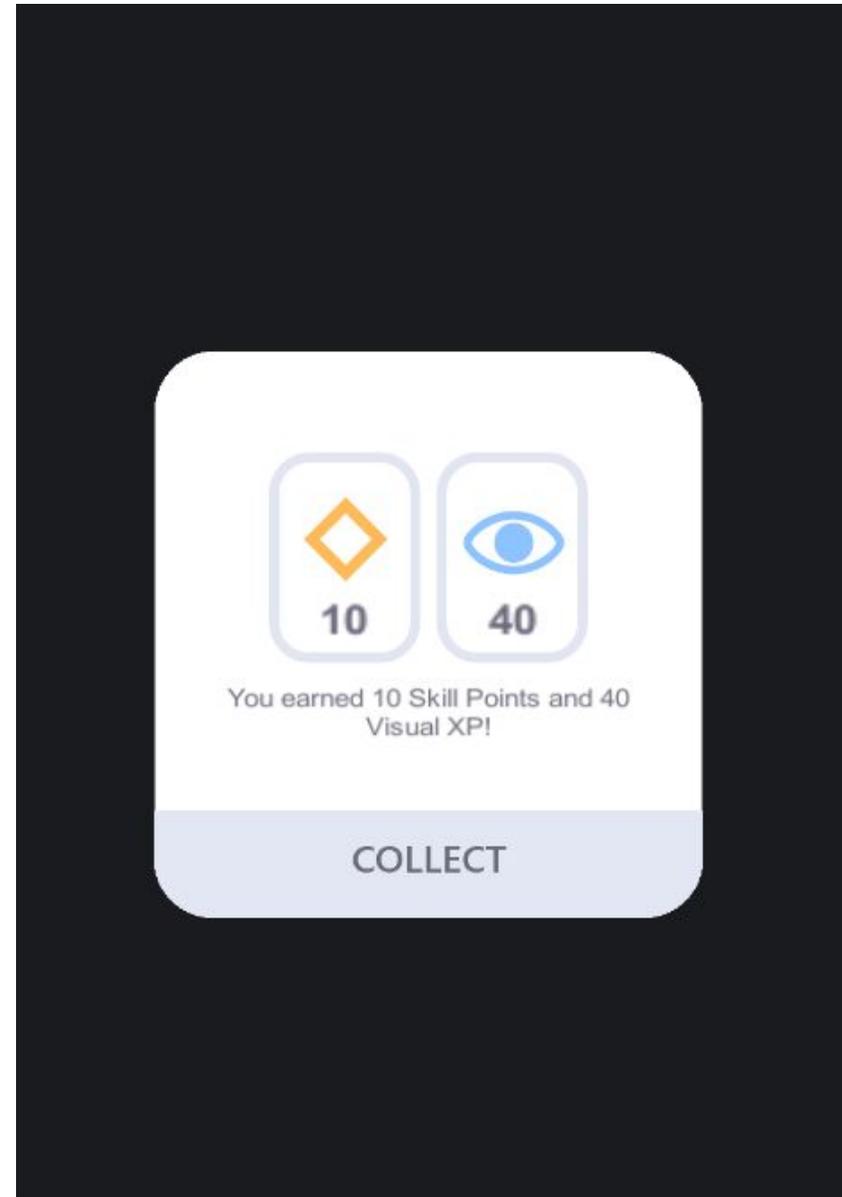
- Camera zooms to winner
- Winner Text Appears
- Transitions to Notification Screen

2.7.3 Critical Components

- None

2.8 Notification Screen

- Uses [\[Notification Screen\]](#)
- Points are earned by the efficiency of the grass cut, and how much fuel was saved



3.0 Level Design Toolkit

The essential building blocks and elements that the user can use to construct a level/puzzle. Each level can consist of two types of building blocks, power ups, etc.

3.1 Essential Objects

- Cuttable Grass
- Start Position
 - Player 1 and 2
- Basic Obstacles
 - Rocks
 - Wall

3.2 Additional Elements

- Obstacles
 - Grass that grows back (GMO or SUPER GRASS)
 - Flowerbeds (these are cuttable but it costs the user fuel, (negative element) Cost: twice fuel lost for every flower bed tile cut.
 - Teleporters
 - Tall Grass (twice as long to cut)
- Risk/Reward Elements (Powerups)
 - Save Fuel - Don't lose fuel for 5 seconds
 - Increase Lawn Mower Size - 2 units long for 5 seconds (cuts more tiles, but harder to maneuver and easier to hit obstacles)

Note: Each level can contain **2 of these elements**. This can allow each level to be different and unique. It can allow for interesting gameplay moments and increase the replayability of the mini-game.

4.0 Design Notes/Research

The lawn mowing puzzle comes from category of puzzles called [“Tour Puzzles”](#)

- A player travels around a board
- Usually, there is a start and end position

This mini-game also derives a majority of elements from [Logic Mazes](#), which requires the users to solve the puzzle using rigid rules that are set on the board. For example, Area-mazes (A-mazes) are puzzles where the area of the tile stepped on must alternatively increase and decrease with every step.

4.1 Puzzle Example: Pokemon Sapphire/Ruby (Sootopolis Gym Ice Puzzle)

Core Mechanic

The player moves in the cardinal directions, but can only step on an ice tile once. The goal of the puzzle is to step all the ice tiles once get to the gym leader who is on the top of the screen. If the player steps on a ice tile twice they fall to a lower section of the level and have to restart from the beginning.

Link: [Gameplay Video](#)



to

5.0 The Problem : Social Interaction

Indiana's Resource Center for Autism, describes that individuals under the spectrum have a tendency to avoid social situations. In two-way conversation, ASD individuals have a hard time hearing another person's point of view or have interest in what they are saying. Individuals under the spectrum tend to deliver one-sided monologues, lectures or lessons about a topic they are interested in rather than participating in a two way conversation.

6.0 Learning Opportunities

This lawn mowing mini-game creates situations where two users must interact with each other to solve the puzzle of cutting a patch of grass effectively.

Some of the learning opportunities that can be derived from this game includes:

- Creating two way conversation to develop strategies/plans
- Codependency (both users must take part in the mini-game in order to be successful)
- Collective problem-solving

7.0 References

Social Communication and Language Characteristics Associated with High Functioning, Verbal Children and Adults with ASD

This article by the Indiana Resource Center for Autism lists some important social communication and language characteristics that individuals with ASD tend to display.

<https://www.iidc.indiana.edu/pages/Social-Communication-and-Language-Characteristics-Associated-with-High-Functioning-Verbal-Children-and-Adults-with-ASD>

Algorithmic Lower Bounds: Fun With Hardness Proofs : Lecture 8: Hamiltonian Cycle and Path

A hamiltonian cycle (also tour, circuit) is a cycle visiting each vertex exactly once. This article shows various examples of problems that use hamiltonicity (such as the traveling salesman problem, lawn mowing problem, etc).

<http://courses.csail.mit.edu/6.890/fall14/scribe/lec8.pdf>

Approximation algorithms for lawn mowing and milling

This paper studies the problem of finding the shortest tours/paths for the “lawn mowing” and “milling” problems. In the milling problem, the “cutter” is constrained to stay within a region. On the other hand, in the lawn mowing problem the cutter is allowed to go outside the constrained region. This paper uses various mathematical formulas to determine some effective ways in mowing or milling a region.

<https://www.sciencedirect.com/science/article/pii/S0925772100000158>

Emotion Crafter: Mini-Game

Technical Design Document

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1.0 Overview

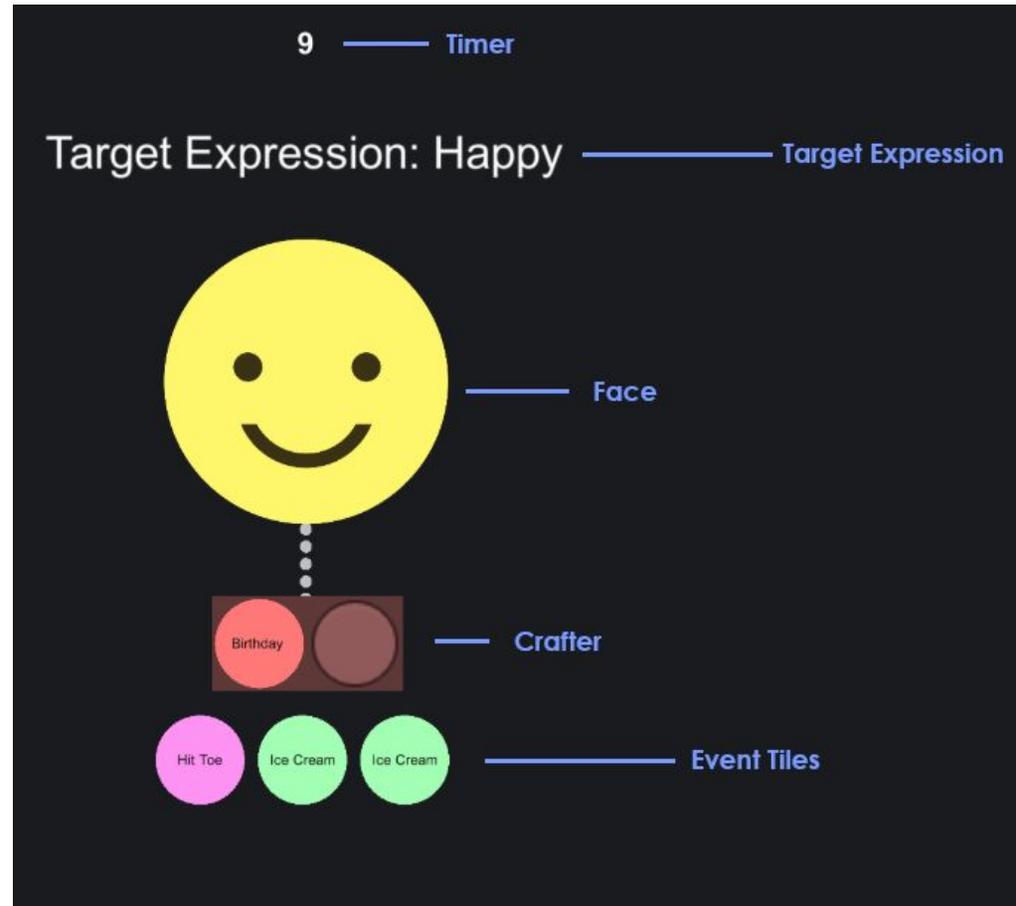
1.0.1 Goal

The player is tasked to make the character on the screen express a specific emotion (i.e. happy). To create an emotion, the player is given an arrangement of event tiles.

1.0.2 Game Mechanics

The player needs to drag and drop event tiles into the crafter and check if their sequence is correct.

In addition, players are rewarded points based on how many levels they complete and how many tiles they used to create the expression (less tiles equates to more points). The playtime of the mini-game is constrained by a timer.



2.0 Mini-Game Screens

A breakdown of screens to be implemented in the game.

2.1 Start Screen

2.1.1 Intention

This window allows the user to enter into the mini game.

2.1.2 Functionality

- Uses [\[Start Screen\]](#)

2.1.3 Critical Components

- Play Button



2.2 Gameplay Screen

2.2.1 Intention

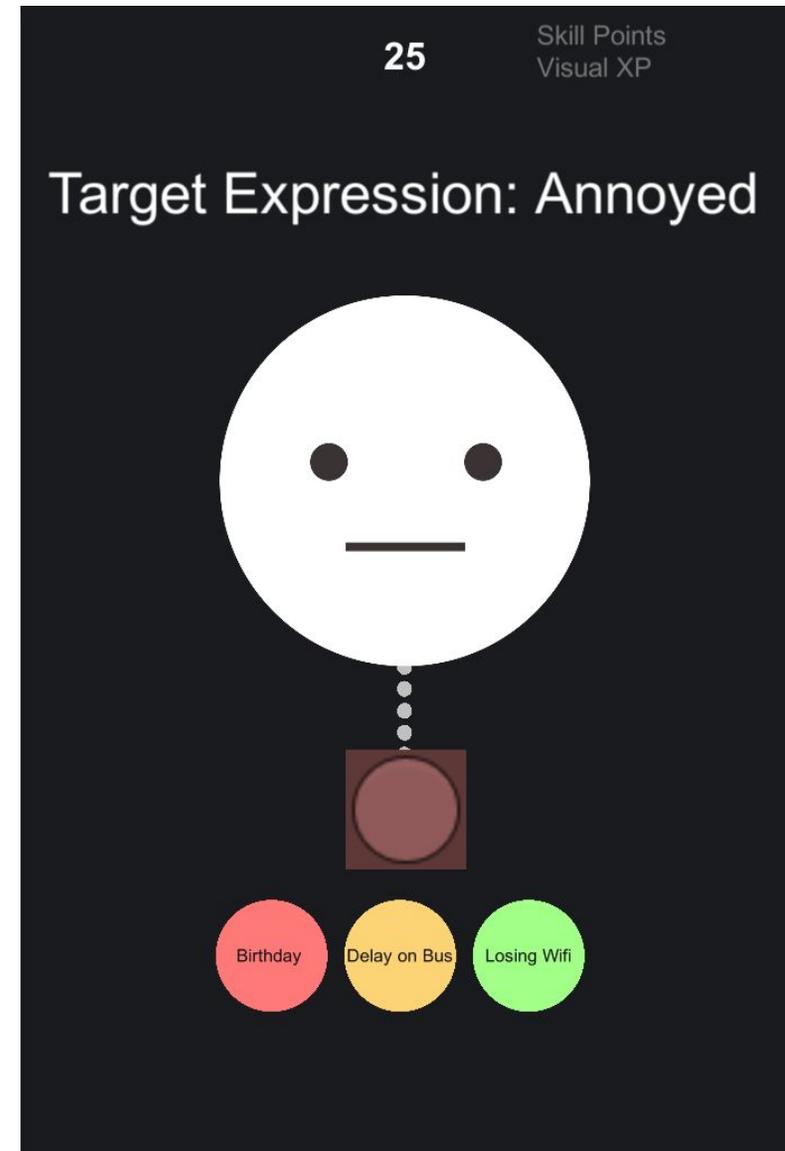
The user is able to craft an expression/emotion using events. The user drags event objects into the crafter (which is connected to the emoji face). Using the event tiles, the user must create an appropriate combination to make the emoji face showcase the target expression.

2.2.2 Functionality

- [Uses [Crafter](#)]
- [Uses [Events](#)]
- [Uses [Recipes](#)]
- [Uses [Levels](#)]
- Drag and Drop
 - The user is able to select and drag objects into the crafter
- Timer
 - Counts down as the game is progressing
- Points

2.2.3 Critical Components

- Custom Crafter Image



2.3 Transition Screen

2.3.1 Intention

When the target expression is achieved by the user, the character changes color and expression. The screen fades and the level changes. In addition, the points earned during the level are added to the players total score.

2.3.2 Functionality

- [Uses [Level Manager](#)]
 - Randomly select a level from a list
 - Change target emotion text
 - Change event objects that the player can use
 - Reset the emotion

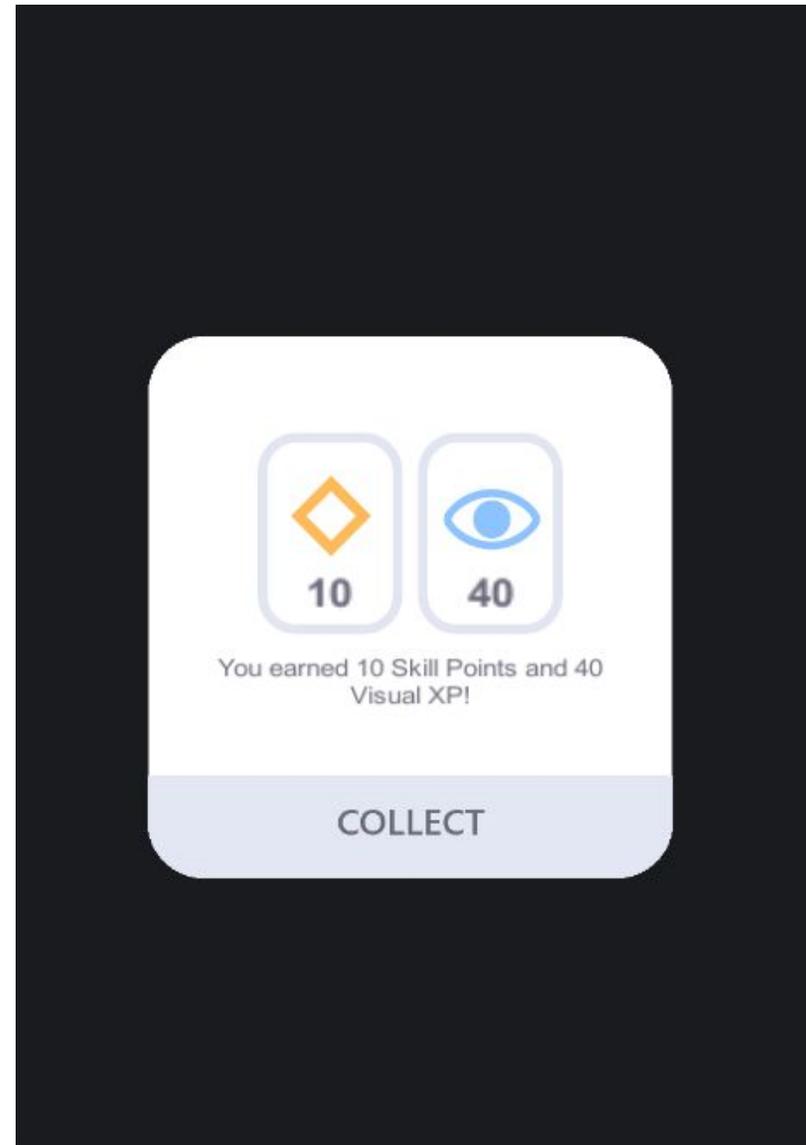
2.3.1 Critical Components

- Transition Animation
 - Fade in/out



2.4 Notification Screen

- [Uses [Notification Screen](#)]
- Points are earned by two factors:
 - How many levels were completed
 - How many tiles were used (less equates to more points)



3.0 Unique Systems

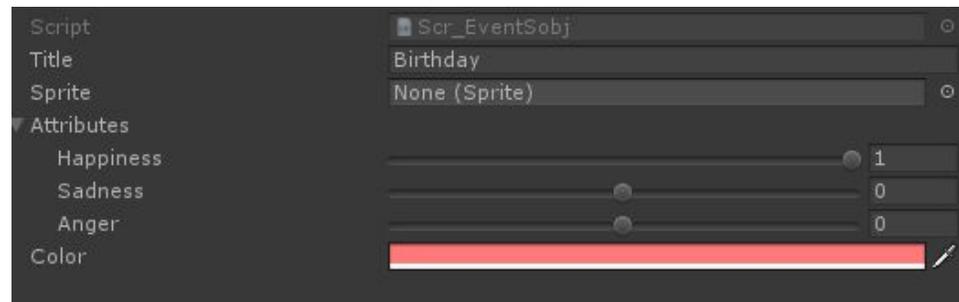
A list of systems, assets and functionality that are used uniquely in this mini-game.

3.1 Events (Event Tiles)

3.1.1 Code

An event is a data object that contains information:

- Title
- Image
- Attributes
- Color

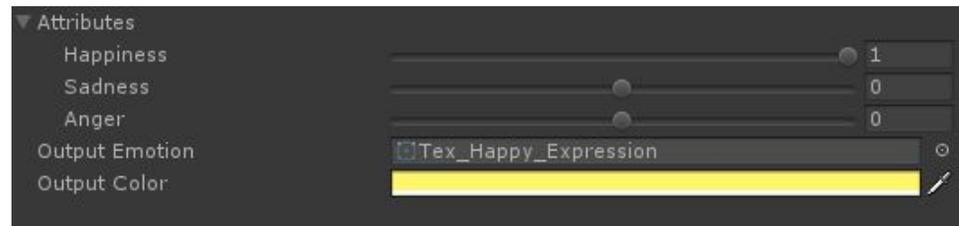


3.2 Recipes

3.2.1 Code

A recipe contains information showcasing what needs to be added in order to create an emotion:

- Attributes
- Output Emotion
- Output Color

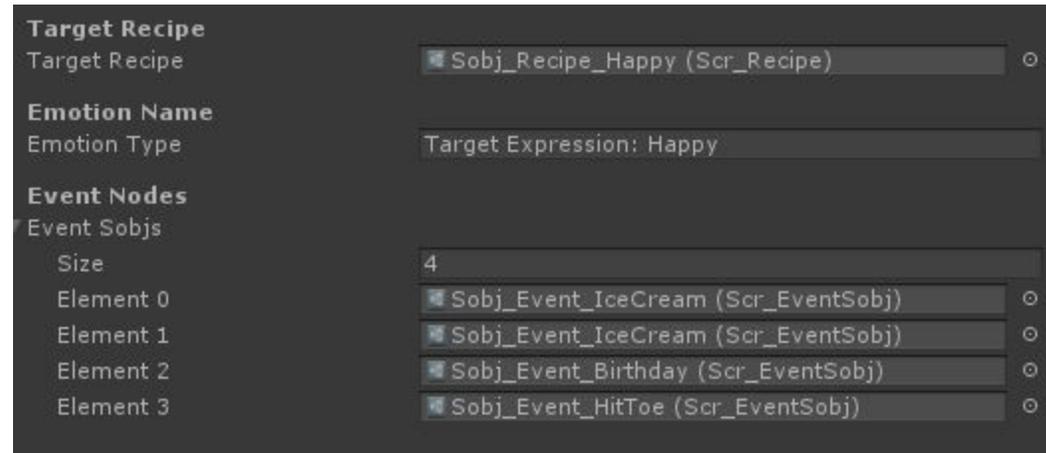


3.3 Levels

3.3.1 Code

A level contains information that allows the game to run and progress:

- Target Recipe
- Emotion Type (Text)
- Event Objects List
 - A list of events that the player can use to make the target recipe



3.4 Crafter

3.4.1 Code

The crafter takes in data from the event tiles that are dropped into it. A calculation is performed where all the attribute data from the event tiles is combined (heuristic) and a error percentage is created. The system then goes through a list of all possible recipes to see if the combination is within a target error range of 3%. If the error is less than or equal to 3%, then the target has a match to a recipe and the emotion is outputted.

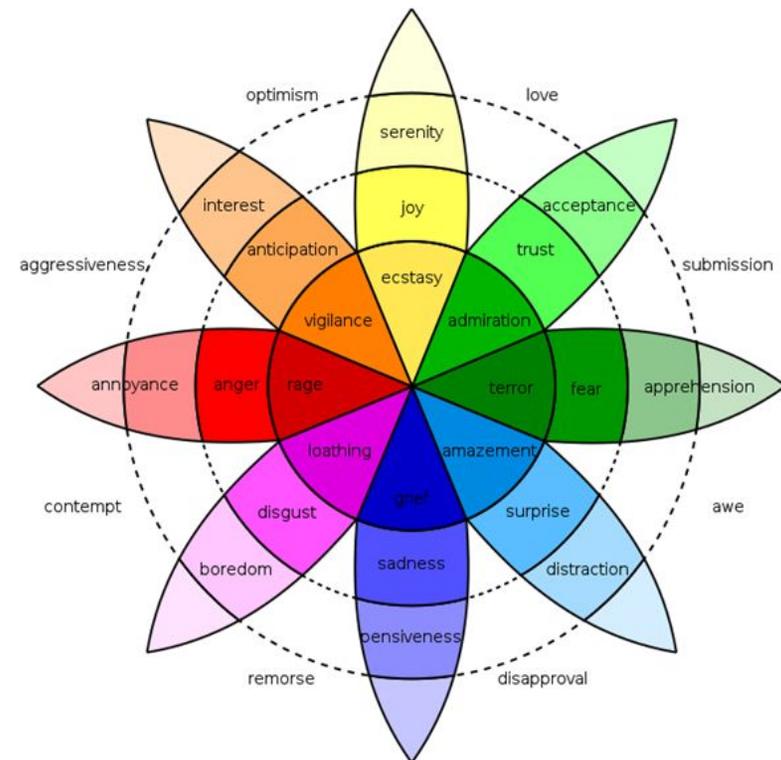
4.0 Design Notes

This mini game is designed around prior [research](#) done on autistic individuals, where they used visual events and asked participants to act out the emotion that they felt was appropriate from a multiple choice selection.

4.1 Additional Features

To cater the mini-game to the target audience, the events chosen are relevant to what college students may have experienced (i.e. staying up late to finish an assignment). To expand upon this idea further, during the initialization stage of the Motify app, it could ask the users questions such as favourite hobbies, sports, etc. Using this data, the mini-game could show and hide content that is relevant to them.

To decrease the level of difficulty, the mini-game can be represented in another mode, where the event tiles are coloured according to the emotion. To expand, angry events are red which tie into the emotion of being angry.



5.0 Learning Opportunities

The [Plutchik Wheel](#) was referenced during the development of this mini-game. This wheel displays emotions through use of hues and shades. The game teaches the user how to distinguish emotions using this model.

Some of the learning opportunities from this mini-game include:

- Create a story (using events) to create complex emotions
- Quick problem-solving and decision-making
- Recognizing and linking emotions to events

6.0 References

Can emotion recognition be taught to children with autism spectrum conditions?

This paper conducted a study in order to determine effective ways of teaching individuals with ASD on how to recognize emotions. They used strategies such as displaying visual events and asking participants to act out the emotion that they felt was appropriate from a multiple choice selection.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2781897/>

Common Systems for Mini-Games

Start Screen

Intention(Design)

This window allows the user to enter into the mini game.

Functionality (Code)

- This screen is initialized when the player taps on the calendar or challenges window in the Motify app to play a mini-game.

Unique Assets (Art)

- Play Button

Notification Screen

Intention(Design)

This screen displays sum of the skill points and experience points they earned while playing the mini game.

Functionality (Code)

- Collect Button: when the user hits this, the earned points will be added.

Unique Assets (Art)

- Notification Panel
- Two Icons
 - Skill Points
 - Social Communication Skill Category

Appendix A:
Design Research and Notes

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1.0 App and Product References

1.1. Jane Mcgonigal: SuperBetter

- 3 to 1 positive emotion ratio (outweighing positives over the negative point of views)
- Small tasks that seem regular, but ultimately build
- Tiny Goals lead to big changes, creating positive habits
- App allows users the opportunity to develop positive habits, by doing daily tasks
- **Tasks focus on**
 - Emotional Development
 - Social Development and Communication (Task Example: Shake hands with someone for 10 seconds).

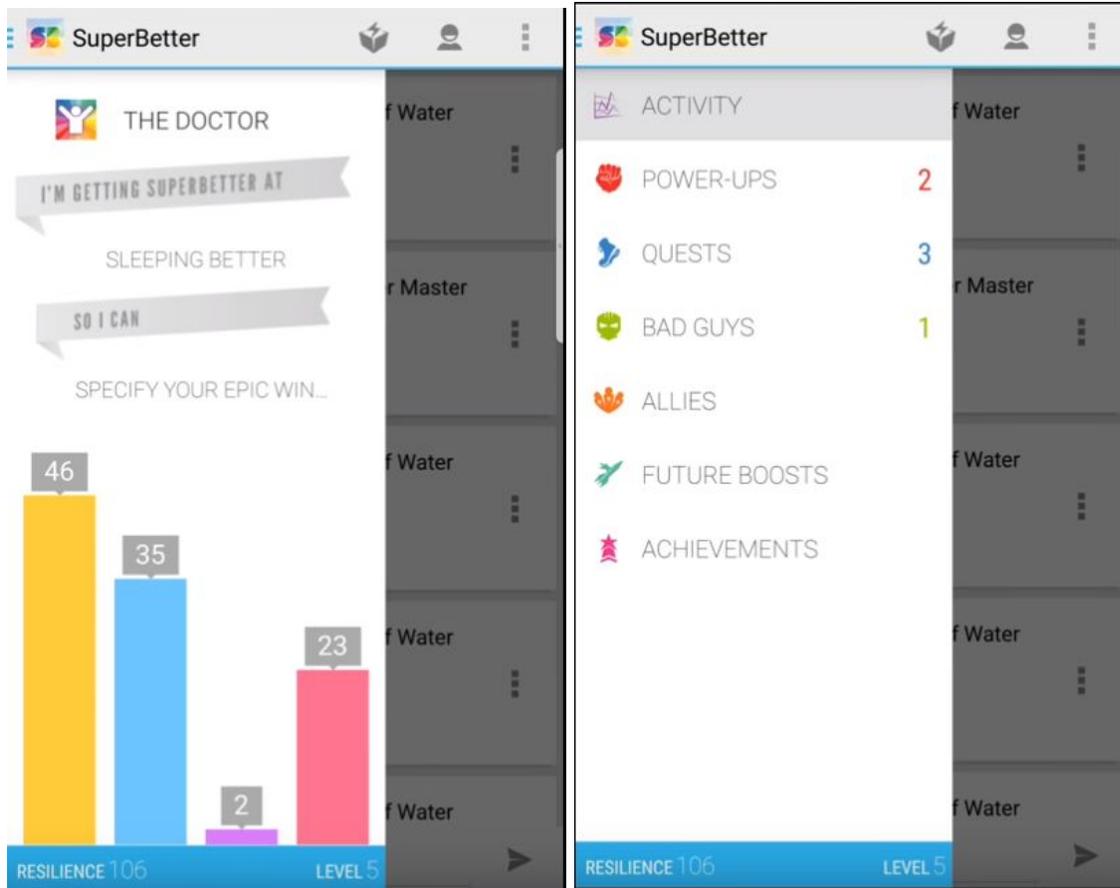
1.2 App Overview: SuperBetter

Categories on Dashboard:

- Power ups
- Quests
- Bad Guys
- Achievements
- Allies

Overarching Skills Are Identified using Bars:

- Mental Resilience
- Emotional Resilience
- Social Resilience
- Physical Resilience

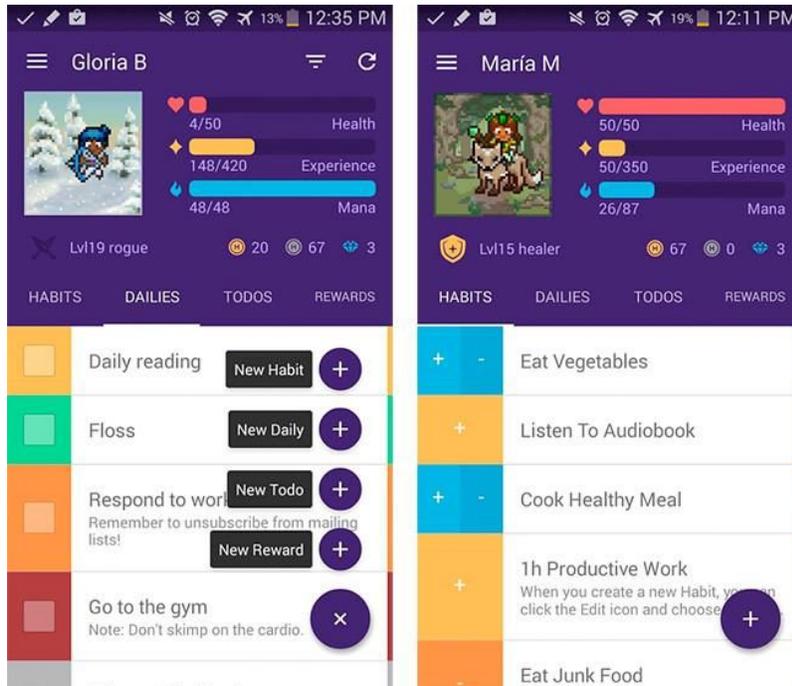


(SuperBetter App Screens)

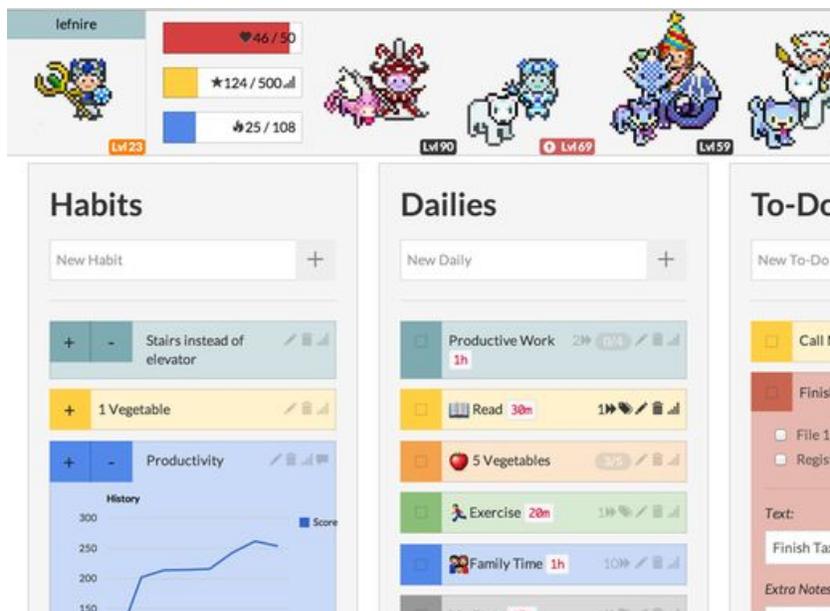


1.3 Habitica

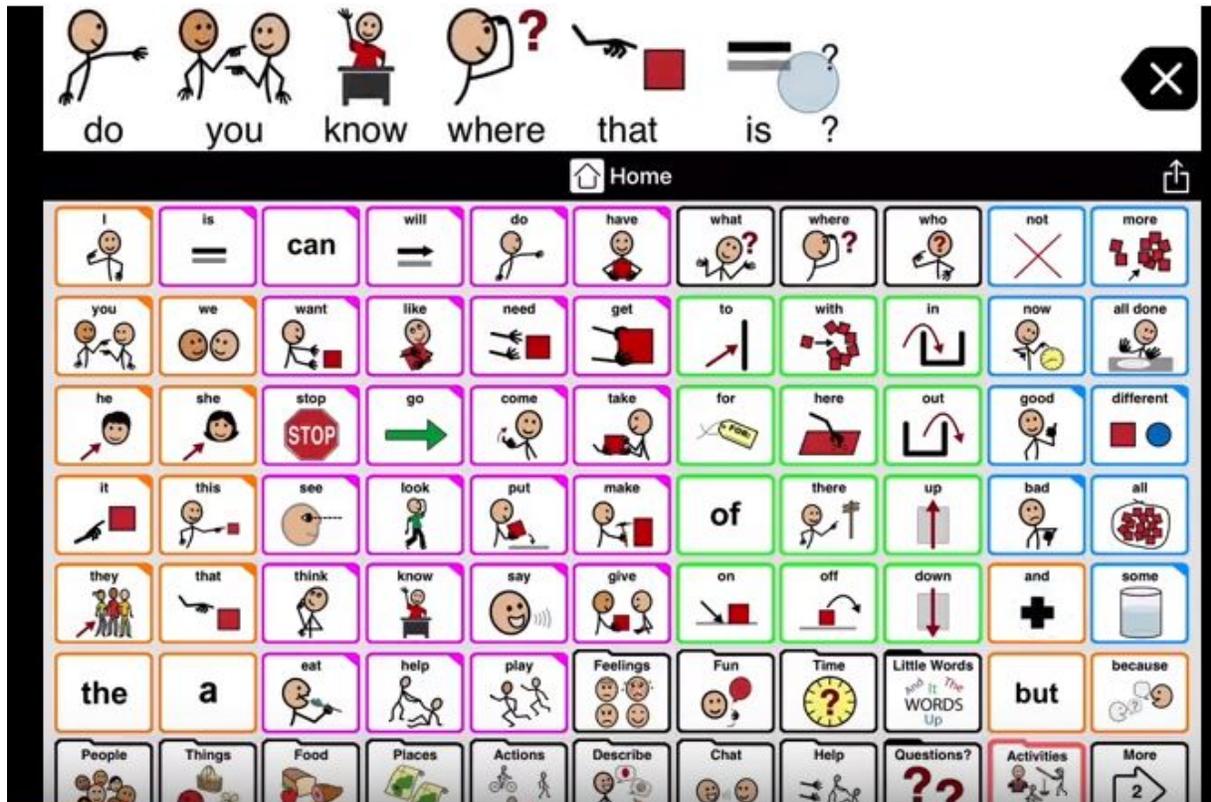
- Visual progression displayed to the user (a sense of achievement)
- Visual Organizing and Simple Notification System
- Fully customizable character (adds some emotional attachment to the user)



- Simple Data tracking, (app notifies visually and using graphs to showcase progress or decline (i.e. productivity).



1.4 Proloquo2Go

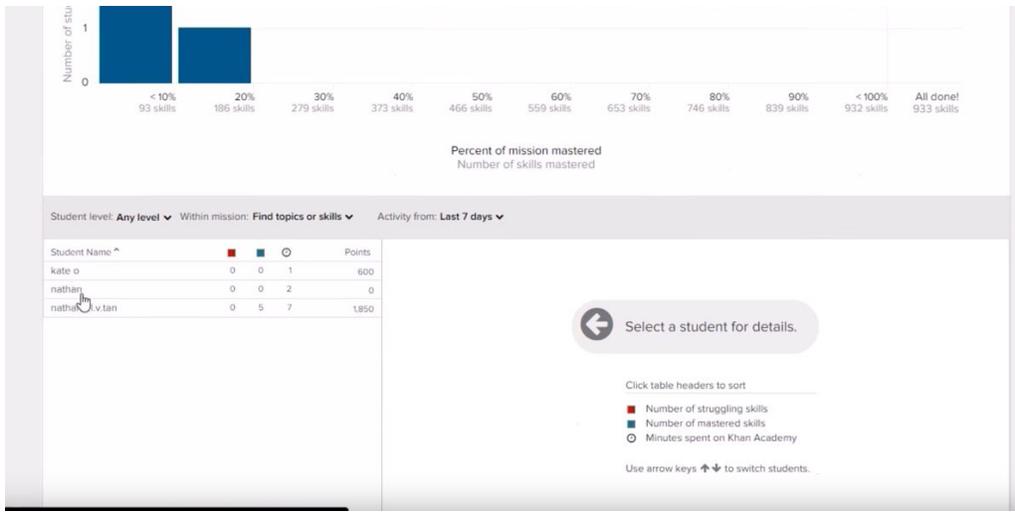


Use visual words to create a sentence

- Visual-based tool for those individuals have trouble communicating orally
- Uses a picture system that creates fragments of words

1.5 Khan Academy: Teacher's Point of View

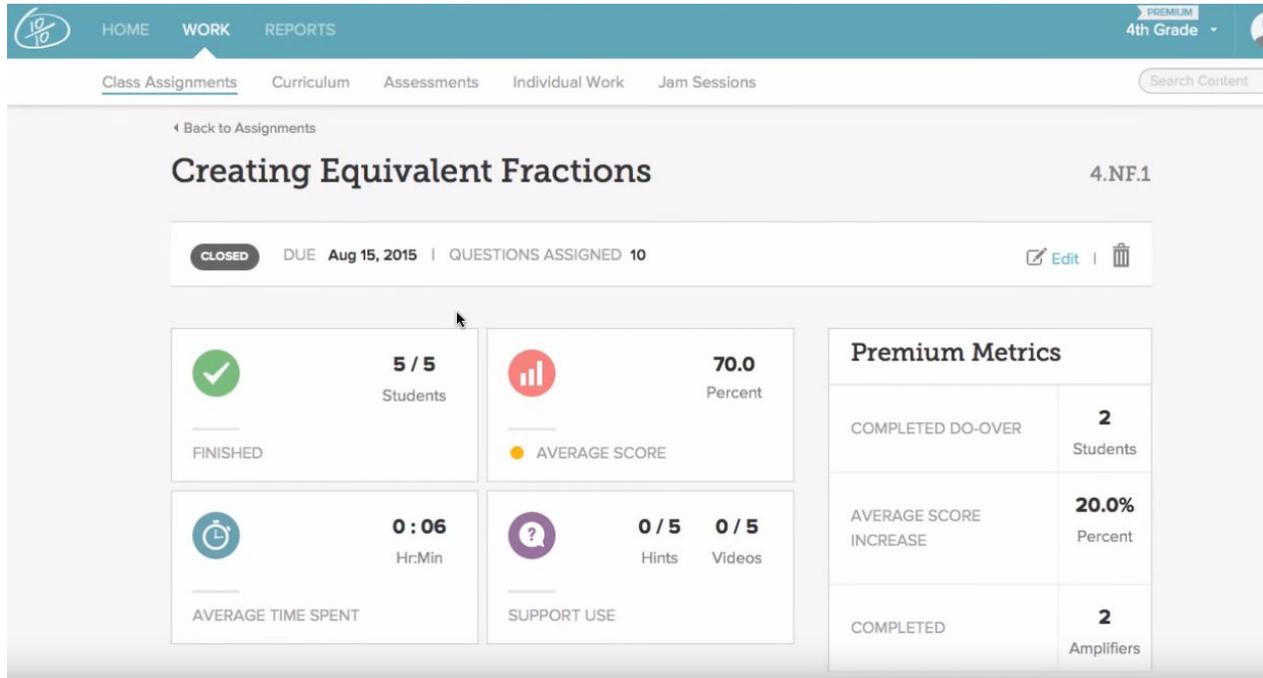
- Teachers can visually see each students progression (using graphed out charts)
- Visual differentiate mastered and struggling skills (Colour coordinated, blue and red)
- Relevant Information provided to teachers
 - Amount of Time Spent Watching Videos
 - Scores (Determining if the students has mastered a skill or needs practice)
 - Time Spent Doing a Particular Question (**Figure 2**)



(Figure 2)

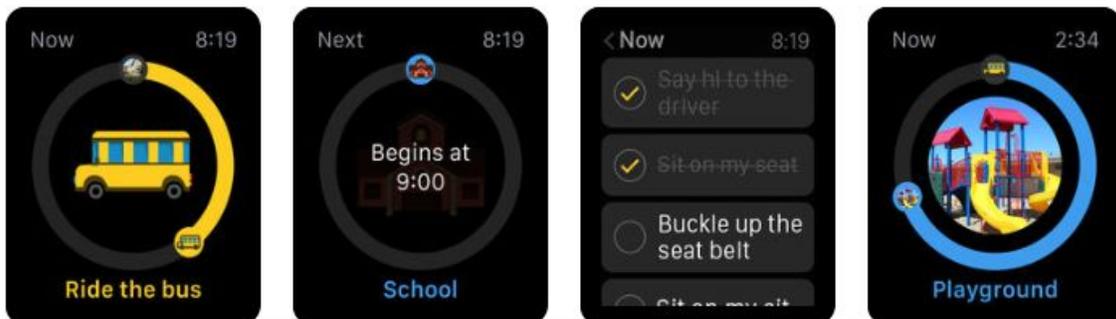
1.6 Tenmarks Amazon

- Learning tool that allows teachers to see visually (using graphs and colors) the progress of the students in their classes.

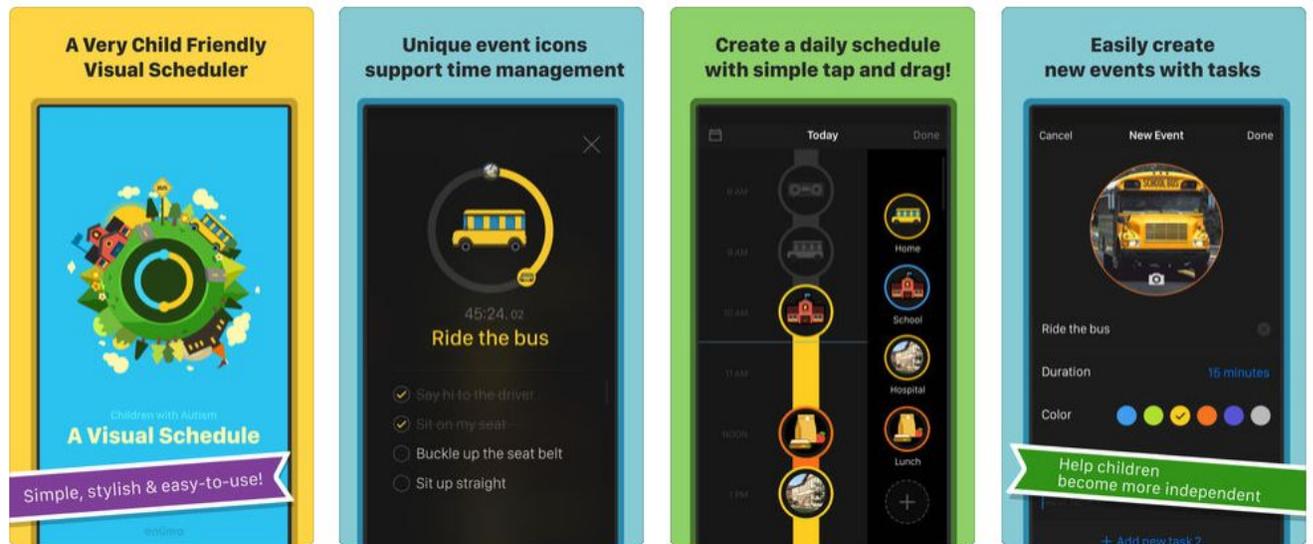


1.7 Children with Autism: A Visual Schedule

<https://itunes.apple.com/us/app/children-with-autism-a-visual-schedule/id1037037909?platform=appleWatch&preserveScrollPosition=true#platform/appleWatch>



(Images Taken from the Apple Watch)



Notes on Design:

- Iconography: Gives users an immediate idea
- Constant Sense of Progression
 - Radial and Linear Bars showing tasks and their completion amount
 - Create **new Events** easily and attach onto the schedule
 - Structured List of Subtasks
 - Example: Bus Ride (Image Above)
 - Subtasks include: Sit up straight, buckle up seat belt
- Flow:
 - User is engaged with an activity
 - Activity is complete
 - App identifies and lets user know to transition
 - App showcases the next scheduled activity will happen
- Simple Customization
 - Displaying time to complete activity
 - Displaying the type of Event, also allowing users to take pictures

1.8 Use of Fidget Toys and Stress Balls

<http://www.aspergerssociety.org/autism-treatment-101-fidget-toys-107/>

- Alleviate Stress and help ASD individual to focus and concentrate on tasks
- Also, help with individuals who have sensory issues
 - Too much noise, smell, color, etc.

Design Behind Fidget Toys:

- Koosh Ball (a soft, squishy, or gooey toy that children can quietly play with)



Koosh Ball

Bubble wrap is seen as an effective cheap tool, due to the tactile and auditory stimulation it produces.

Other Toys:

- Generally, soft but tactile toys, that respond to touch and give out some sort of outward response (i.e. click, or pop sound)



Tangle Jr.
\$4.99 \$3.99



Squeeze Star
\$0.99



Tactile Tangle Relax
\$8.99 \$5.99



Squigglets Sensory
Bracelets
\$5.99 \$4.99



Fidget Set
\$54.99 \$49.99



Pencil Fidget Topper Set
of 3
\$6.59 \$5.99



Tactile Atom Ball
\$4.99 \$3.59



Popping Fidget
\$9.99 \$5.99



Isoflex Ball
\$7.99 \$4.99



Wood Fidget Puzzle
\$4.79 \$2.99



Stress-less Gel Ball
\$6.99 \$4.99



Thera Cube
\$9.99 \$7.99

1.9 My Boo Virtual Pet and Mini Game

<https://itunes.apple.com/us/app/my-boo-virtual-pet-mini-game/id706099830?mt=8>



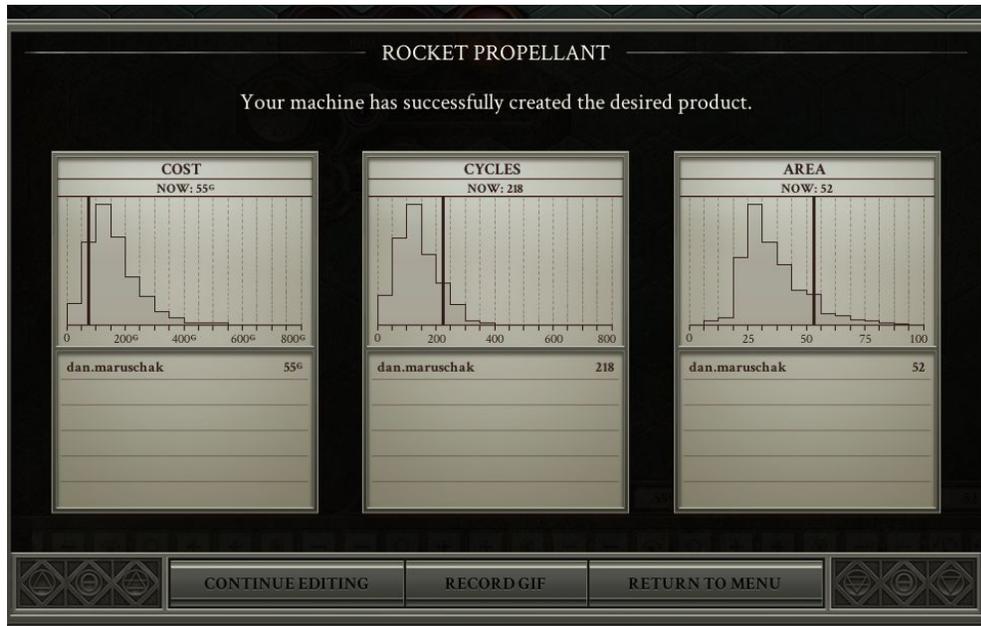
Notes on Design:

The pet is the central focus of the app, it is integrated in all aspects. For example, the user is able to customize the pet. The playable avatar in mini-games is the users pet. There can be a strong emotional attachment to this virtual avatar, if a user plays this game for a longer period of time.

1.10 Game: Opus Magnum

https://store.steampowered.com/app/558990/Opus_Magnum/

Once a system is built, the game shows users a histogram of efficiency compared to all other users who have played the game. It shows what spectrum they fall under, whether it be the most efficient to the least efficient. (Histogram Below). **A histogram can be useful when showing a students progression in their grades.** It can determine if they are close to their goal or far away from it.



Gameplay:

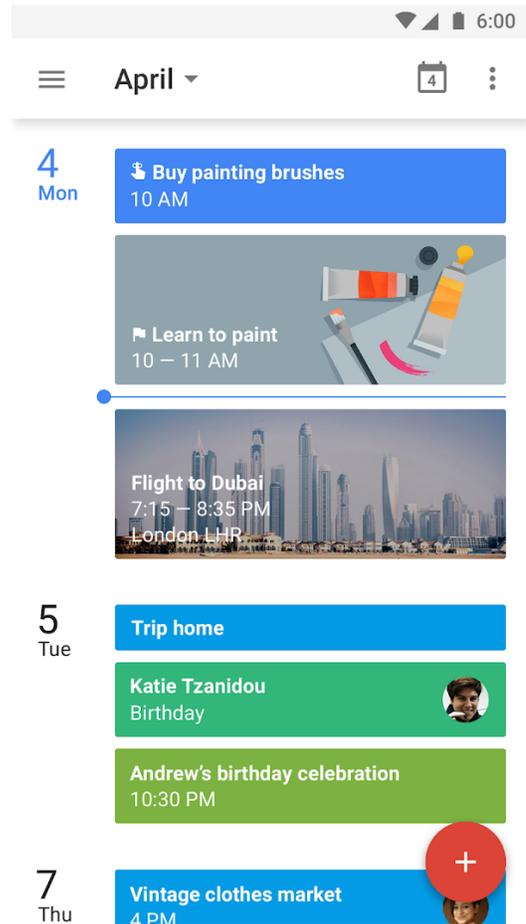
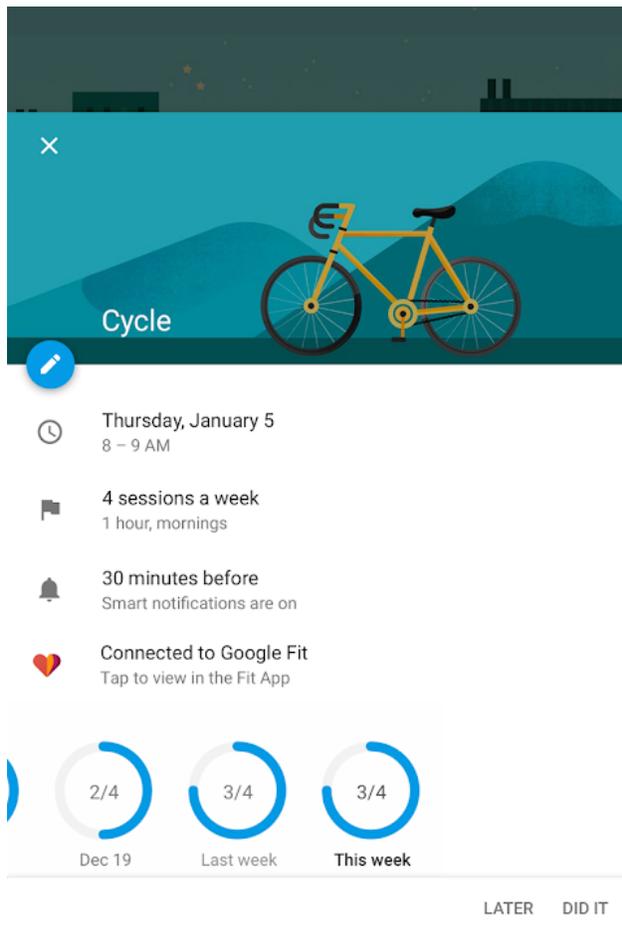


2.0 Calendar Apps References

2.1 Google Calendar

Design Notes:

- Vertical Layout
 - Card Based system
 - Includes text and image
 - Time and Length
- Daily Activities are describe the length and sessions per week, notifications and etc.
- Larger and longer activities take up more space on the visual timeline on the calendar
- Meetings with individuals have icons of the persons face.



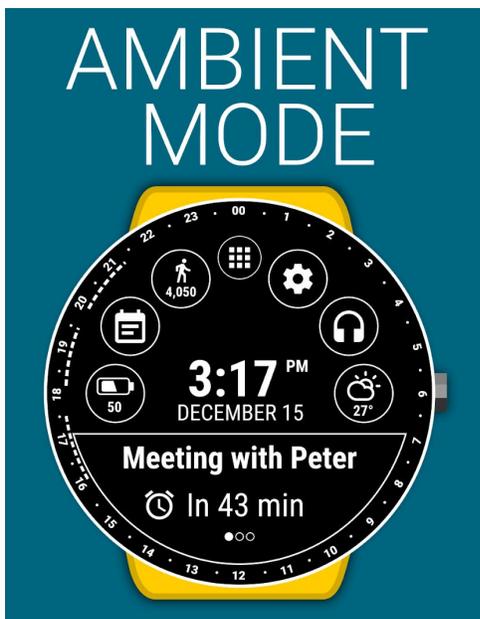
2.2 Calendar Watch Face (by HuskyDEV)

Design Notes:

- Watch interface with a permanent notification section
- Reminds user of upcoming events, meetings and etc
- Slider to view upcoming events
- Colors of red showcase urgency of doing the next task

Limitations:

- Cannot view schedule in a macro scale
- Heavily focused on text, less on visuals



2.3 Challenger Timer App

Pros:

- Working productively, allows the user to go up in rank
- Limits distractions
- At the end of a work session, you are rewarded with a break
- Challenge Timer uses CD2 to drive users to complete tasks and objectives. When you complete a task, it gets marked off as “achieved”, making the user feel good about their work.
- **Core Drive 6: Scarcity & Impatience:** the lack of a pause button creates a limited, forced window for you to complete your task. By limiting your ability to get distracted, Challenge Timer forces you to stay focused.

- **Core Drive 8: Loss & Avoidance:** if you get distracted or need to stop your task, then you have to click on the “Forfeit Work Session” button—admitting defeat. Players don’t like to lose or get defeated, so this drives them to stay focused and complete the task.

2.4 Moleskin Timepage (Calendar)

Walkthrough: <https://www.youtube.com/watch?v=u0Jzr0vgONY>

Design Notes:

- Clear Distinction for schedule in a macro scale
- Contrast between schedule (black) and the day which is an different color
- Variables such as Locations are distinct and separate into categories
- Readability (using distinct flat colour palettes)



3.0 References/Scholarly Articles/ Journals

3.1 General References to ASD

[https://www.autismontario.com/Client/ASO/AO.nsf/object/Forgotten+Report+Autism+Ontario/\\$file/Forgotten+Report+Autism+Ontario.pdf](https://www.autismontario.com/Client/ASO/AO.nsf/object/Forgotten+Report+Autism+Ontario/$file/Forgotten+Report+Autism+Ontario.pdf)

3.2 Social Communication and Language Characteristics Associated with High Functioning, Verbal Children and Adults with ASD

<https://www.iidc.indiana.edu/pages/Social-Communication-and-Language-Characteristics-Associated-with-High-Functioning-Verbal-Children-and-Adults-with-ASD>

ASD individuals tend to:

- Deliver monologues, lectures, or lessons about a favourite topic rather than allow/participate in a two-way conversation with someone
- Talk aloud to self in public situations and are unaware that others can hear what they are talking about, and they are making judgements
- Difficulty with figurative language (metaphors, idioms, etc).
- Difficulty with WHO, WHAT, WHERE, HOW, WHY, WHEN

3.3 Benefit of Online Communities and Social Networking Sites

<http://analoggamestudies.org/2017/05/who-has-access-making-accessible-play-spaces-in-minecrafter-for-children-with-autism/>

- Pinchevski and Peters 2015). **Online communities, including social networking sites,¹⁹ can create multiple avenues for communication for those who are uncomfortable with face-to-face interactions.**
- Safe and Secure Community Environment, allowing restricted access for individuals with autism

3.4 Verbal Communication (ASD): Dungeons and Dragons

<http://www.cbc.ca/news/canada/nova-scotia/dungeons-dragons-autism-communication-social-s-kills-community-1.4433503>

- Dungeons and dragons is a good case study example of facilitation of communication between individuals
 - Most of the experience requires communication
 - Commonly shared goals (i.e. slaying a dragon) brings out collaboration and communication between the individuals who are playing it.

3.5 Reasoning Behind Creating a Structured Daily Schedule

<http://www.autismsupportnetwork.com/news/autism-homework-beyond>

- **Dynamic organizational systems and skills** involve constant adjustments to prioritise, workloads, timeframes, tasks and places. They are less teacher-directed and more student-directed
- **Static organizational systems and skills** are structured: same thing, same time, same place, same way. We break down tasks and ask students to explicitly complete very defined units of information, at a certain time and place.

3.6 Visual Schedule Guides For ASD Elementary School Children

<https://www.iidc.indiana.edu/pages/using-visual-schedules-a-guide-for-parents>

Rationale for Designing Visual Schedules:

- It utilizes the individual's visual strengths and therefore provides a receptive communication system to increase understanding;
- It helps the individual to learn new things and broaden their interests;
- It provides tools that allow the individual to use skills in a variety of settings;
- It can increase the individual's flexibility;
- It helps the individual remain calm and reduces inappropriate behaviors; and
- It helps the individual to develop independence and resulting self-esteem.

<https://autiplan.com/why-visual-schedules-autism>

Notes:

- Children and adults with Autism have a great need for structure and safety. Sudden changes can seem threatening and cause stress and behavioral problems.

3.7 Designing Aesthetics and Colour Palettes For ASD Individuals

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5179595/>

- A study conducted on Color Preference for Children with Autism Spectrum Disorder
 - Concluded that ASD find yellow as being sensory overloading
 - Among the colors: **Red, Pink, Yellow, Brown and Green**
 - ASD individuals are more likely to prefer **Brown and Green**

Lowering Saturation and Subtle Color Palette may be more effective for the web based app.

Colors and Patterns

Intensive color usually distracts and gives anxiety to the children with autism.

A group study done by [GA Architects](#) states that using soft, calm and dark colors while designing interior design for rooms created for kids with autism, helps kids to focus more and allow them to have a longer session of studying.



3.8 Adult Autism Spectrum: Tests

<https://autismcanada.org/about-autism/diagnosis/screening-tools/adult/>

The Quiz asks questions such as (how individuals feel about communicating with others)

Score based system, used as a range to describe risk of ASD

1-20:	Low Risk
20-29:	Average Risk
30-50:	High Risk

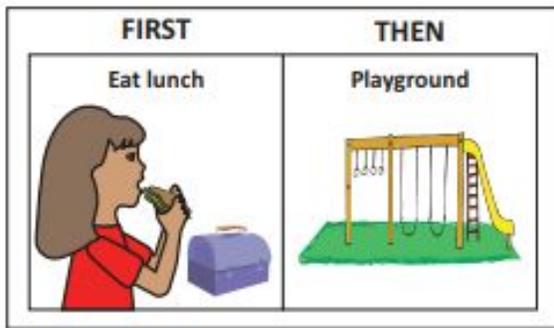
3.9 First - Then Visual Organizational System

https://www.autismspeaks.org/docs/sciencedocs/atn/visual_supports.pdf

Visual Diagrams are useful communication tools as children with ASD may not understand verbal communication.

First - Then Boards are helpful with following directions and learning new skills.

- Complete multi-step directions and activities and use more complex visual systems



Using first to determine what to do, and then set the reward for what happens after completing it.



Multi item resources (such as eating ice cream), cross out what has been consumed. This

showcases a limit and a sense of progression.



3.10 Goal - Setting For ASD Individuals

<https://link.springer.com/article/10.1007/s40489-014-0022-9>

During training with the research assistant, each student selected an achievement goal: daily or weekly in-class assignments, or homework assignments for the week, and developed a goal statement of what was required and by when.

A study plan was specified, and each student self-monitored work completion.

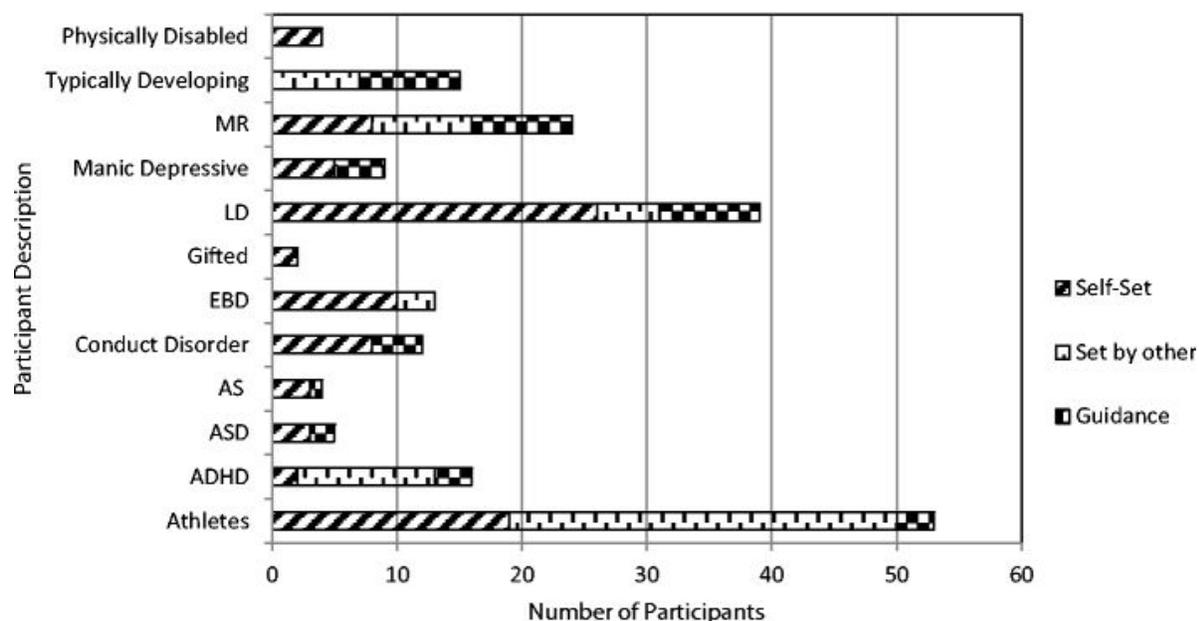
Subsequently, students met with the research assistant to evaluate the goal and the plan, addressing reasons for success or failure in goal attainment.

(Students need a consistent reminder of how they are doing with tasks, this is necessary so they can adjust and learn what they need to do)

Goal Setting Model:

1. Goal Determination
2. Goal Setting
3. Goal Reviewing

Goal setting method used by participants



3.11 Establishing Long Term Goals for People with ASD

<https://www.iidc.indiana.edu/pages/Establishing-Long-Term-Goals-What-Are-We-Hoping-to-Achieve>

Living Space:

- Independent or with a caretaker

Work:

- Learning effective communication skills

Leisure Activities:

- Physical Activities (Sports)
- Dating and Relationships

Community Skills:

- Public Transportation, Community Services (i.e. public pool)

Free/ Unstructured Time:

- Reading, using a computer, pursuing hobbies, and drawing

Self Management Skills:

- How to relax under stress, seeking info when confused or scared, moving in a community in a safe manner

Personal Management Skills:

- Proper Hygiene, Maintaining Sleep Patterns, maintain physical health, accessing proper health care officials when needed.

3.12 Educational Goals ASD

<https://www.nap.edu/read/10017/chapter/18#216>

The appropriate goals for educational services are the same as those for other children: **personal independence and social responsibility.**

3.13 Goal Setting

https://www.researchgate.net/publication/310779747_Using_Self-Monitoring_With_Guided_Goal_Setting_to_Increase_Academic_Engagement_for_a_Student_With_Autism_in_an_Inclusive_Classroom_in_China

Included guided goal setting with **data-based teacher feedback into a self-management** intervention package designed to improve student on-task behaviors in the regular classroom setting

The student-directed goal setting involved self-recording the number of written words, evaluation of goal attainment, and determination of a new goal of 10% increase when the previous goal was achieved.

3.14 Study into Games That Improve Social Communication Skills for ASD Children

<https://www.sciencedirect.com/science/article/pii/S1877050914014768>

Table 1. Descriptions of the modules

	Methods	Objectives	Target Skills	
			Social	Communication
Introduction	Two-ways communication using voice recognition	To create a friendly environment for the child during interaction	<ul style="list-style-type: none"> • Eye contact • Emotions 	<ul style="list-style-type: none"> • Repetition words • Speech tone • Skill to answer
Game I	Object/vision recognition	To observe the child in writing numbers activity	<ul style="list-style-type: none"> • Behaviour • Emotions 	<ul style="list-style-type: none"> • Skill to answer
Game II	Two-ways communication using voice recognition	To observe how the child answer questions	<ul style="list-style-type: none"> • Eye contact • Emotions • Behaviours 	<ul style="list-style-type: none"> • Repetition words • Speech tone • Skill to answer
Game III	Imitation	To observe the imitation ability in children	<ul style="list-style-type: none"> • Eye contact • Behaviours • Imitation 	none

3.15 Serious Games That Teach Social and Emotions to Individuals with ASD

<https://hal.sorbonne-universite.fr/hal-01525828/document>

3.16 Improving Social Skills of Adults With Autism Spectrum Disorder Through Physical Activity, Sports, and Games: A Review of the Literature

<https://onlinelibrary.wiley.com/doi/full/10.1002/adsp.12008>

Social Skills Training Methods:

Peer Training

Priming:

Written scripts have been used to assist children with ASD to interact more effectively. At the end of an activity, children are taught to follow-up with peers, initiating scripted questions such as, “Did you like the activity?” or “What did we do well?” or “What do we need to work on?” In a historic study (Krantz & McClannahan, 1993), unscripted initiations were observed and maintained at a 1-month follow-up without verbal prompts.

Video modeling

This strategy requires participants to prepare for an upcoming event by watching videotaped demonstrations of skills to be performed. Participants then imitate the skills learned during the planned activity.

<https://pdfs.semanticscholar.org/0f1f/fe38738d83e0aaebab48e516894e31741e18.pdf>

American researchers have proven the effectiveness of Self-management for development of skills of maintaining a conversation, because this intervention has led to better communication among people with ASD, it raised their interest, naturalness and kindness when communicating with interlocutors

3.17 People with Autism Can Read Emotions, Feel Empathy

<https://www.scientificamerican.com/article/people-with-autism-can-read-emotions-feel-empathy1/>

- feeling emotions but being unable to identify them

In 2013, we tested the ability of people with alexithymia, autism, **both conditions or neither to recognize emotions from facial expressions**. Again, we found that alexithymia is associated with problems in emotion recognition, but autism is not. In a 2012 study, researchers at Goldsmiths, University of London found exactly the same results when they tested emotion recognition using voices rather than faces.

Recognizing an emotion in a face depends in part on information from the eyes and mouth. People with autism often avoid looking into other people's eyes, which could contribute to their difficulty detecting emotions.

What's more, our work demonstrates that we urgently need tools to help individuals who have both autism and alexithymia understand their own and other people's emotions.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2781897/>

- (a) 4. Charlie is going to get the pieces for the new special clock



- (b) 6. The neighbour's dog has bitten people before. He is barking at Louise.



<https://www.sciencedirect.com/science/article/pii/S0028393212004800>



4.0 Interaction Design and Gamification

4.1 Research on Gamification

<http://yukaichou.com/gamification-examples/octalysis-complete-gamification-framework/#.WxGO-UgvxaQ>

4.2 Level Up! The Role of Progression for Gameful Design

<https://medium.com/gameful-design/level-up-the-role-of-progression-for-gameful-design-ce7a87e2b70>

1. Clear Goals and Progress
2. Constant and Immediate Feedback
3. Balance between the perceived challenge and the perceived level of skill needed.

Which skills will the user be developing?

What is the best way to keep track of users' progress (increased skill)?

What is the best way to adjust the challenges in the system according to the current user's skill?

4.3 Principles of Interaction Design

1. **Consistency**
 - a. Persistent Layout, Proportions
 - b. Remove small distractions
2. **Perceivability**
 - a. Invites interaction
 - b. Limit confusion on what is and isn't an interaction
3. **Learnability**
 - a. Interactions are easy to learn and remember
4. **Predictability**
 - a. Accurate expectations of what happens before the interaction has occurred
 - b. What can be done, such as providing examples and instructions
5. **Feedback**
 - a. Failure to acknowledge an interaction, or provide feedback that is not noticed, can lead to unnecessary repetition of actions, mistakes and errors.



4.4 Compulsion Loops & Dopamine in Games and Gamification

https://www.gamasutra.com/blogs/SebastienSamson/20171113/309468/Compulsion_Loops_Dopamine_in_Games_and_Gamification.php



4.5 Mobile App Gamification. 5 Main Things to Consider

<https://medium.com/swlh/mobile-app-gamification-5-mainthings-to-consider-f47cdf1e6610>

4.6 Gamification in Game Education

https://www.gamasutra.com/blogs/PaulRoberts/20170313/293529/Gamification_in_Game_Education.php

4.7 The Right App Rewards Boost Motivation

<https://medium.com/googleplaydev/the-right-app-rewards-to-boost-motivation-c1ec86390450>

Points:

- Indicators of achievement and progress. Points can reward the users with status (if used to rank users against each other).
- Tangible Rewards: used to spend on in-game currency to buy items, customizations and etc.

Badges:

- Used to recognize the users accomplishments
- Virtual status symbols and distinguishing badge holders from each other

Leaderboards:

- Indicating progress against others, competitive elements, creates different status levels

Reward users
the right way



4.8 Gamification milestones for mobile apps. Infographics.

https://www.gamasutra.com/blogs/levgenLeonov/20150331/240089/Gamification_milestones_for_mobile_apps_Infographics.php



4.9 Studying Gamification: The Effect of Rewards and Incentives on Motivation

<http://gsb.haifa.ac.il/~sheizaf/RichterRabanRafaeliStudyingGamification.pdf>

Table 2.1 Theoretical base of incentives and rewards

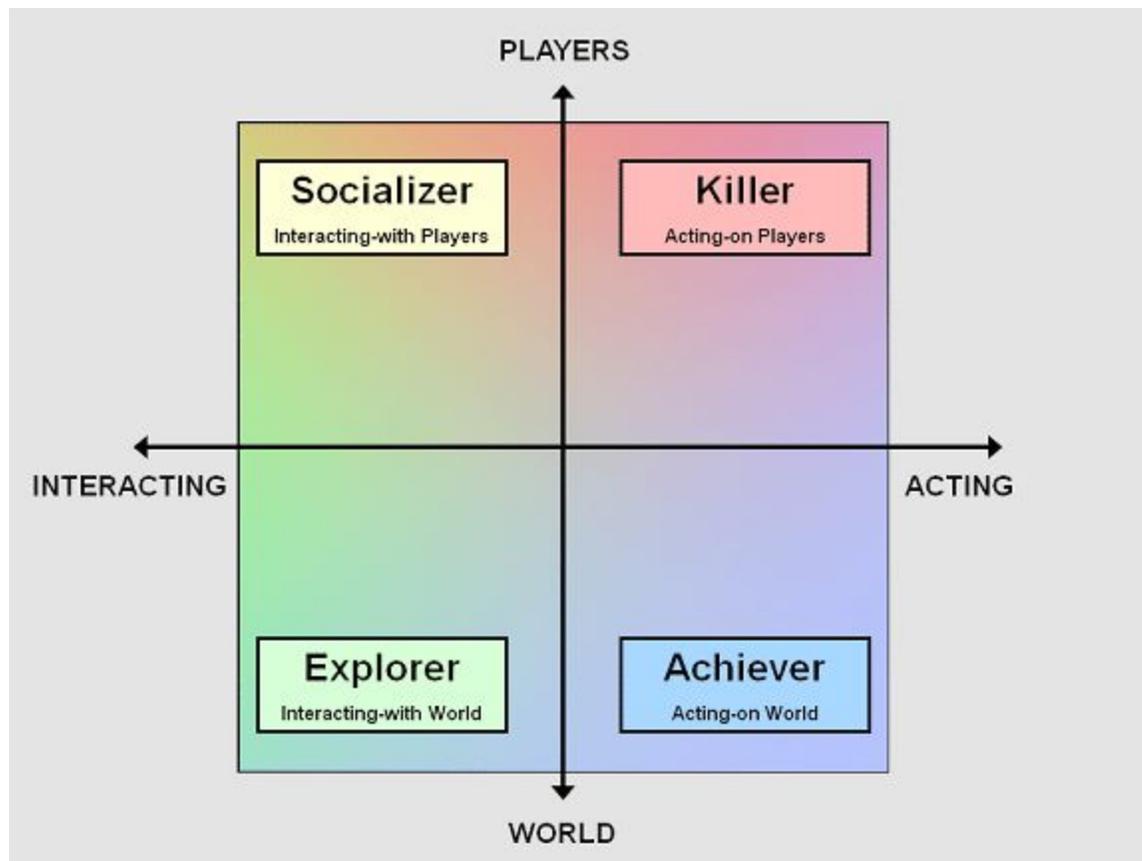
Motivation theory	Incentives/rewards	Role
Self efficacy	Audio/verbal/visual/music/sounds effect	Feedback
	Progress bar	Feedback, achievements
Self-efficacy, goal-setting, PIT, expectancy value, need achievement	Points/bonus/divident	Feedback, reward, status, achievements, competition, progression, ownership
	Mini games/challenges/quests	Reward, status, competition, achievements
Self-efficacy, goal-setting, PIT, expectancy value, social comparison	Badges	Status and reputation, achievements and past accomplishments, collection, competition, ownership
	Virtual goods	Reward, social, status, achievements, ownership, self-expression
	Leaderboard	Status and reputation, achievements, competition
	Rewards-choosing colors, power	Achievements
Self-efficacy, goal-setting, PIT, expectancy value, need achievement, social comparison	Achievements	Collection, status, competition, discovering, progression
	Levels	Feedback, status and reputation, achievements, competition, moderate challenge
Social comparison, personal investment theory, expectancy value	Avatar	Social, self-expression, ownership

4.10 Personality and Play Styles: A Unified Model

https://www.gamasutra.com/view/feature/134842/personality_and_play_styles_a_.php

Four Bartle Types:

- **Killers:** interfere with the functioning of the game world or the play experience of other players
- **Achievers:** accumulate status tokens by beating the rules-based challenges of the game world
- **Explorers:** discover the systems governing the operation of the game world
- **Socializers:** form relationships with other players by telling stories within the game world.



4.11 Bartle's Player Types for Gamification

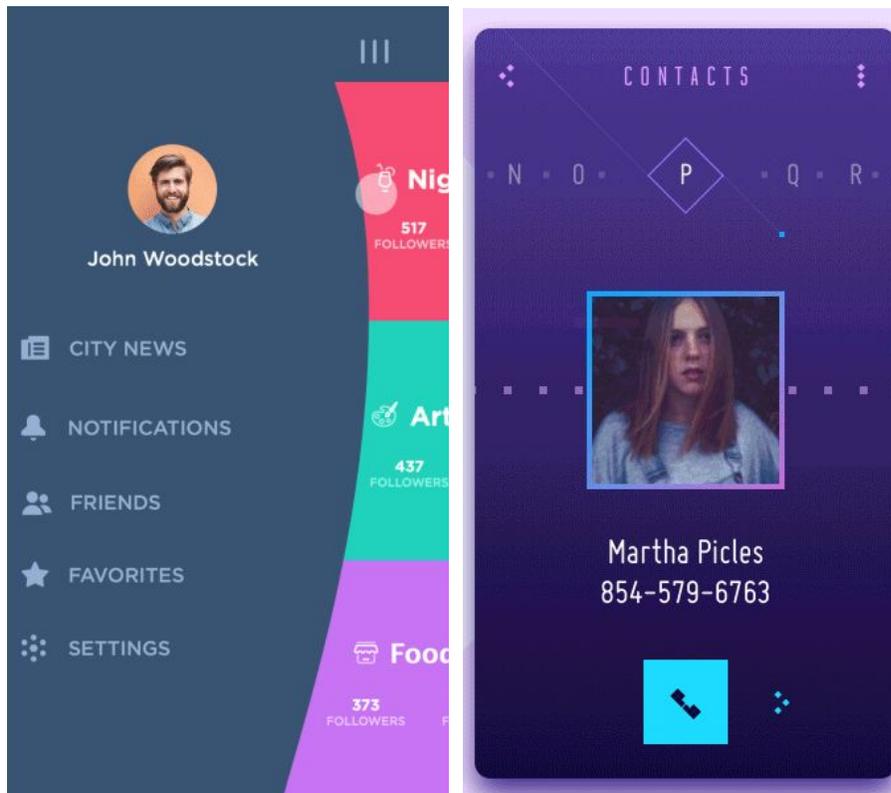
<https://www.interaction-design.org/literature/article/bartle-s-player-types-for-gamification>

4.12 4 Golden rules of UI Design

<https://theblog.adobe.com/4-golden-rules-ui-design/>

4.13 Mobile UI Design: 15 Basic Types of Screens

<https://tubikstudio.com/mobile-ui-design-15-basic-types-of-screens/>



4.14 Creating an Effective Filter System UX

<https://medium.com/@laura.cunha/crafting-a-kickass-filtering-ux-beea1798d64b>

4.15 User Friendly Search Bar

<https://uxplanet.org/mobile-ux-design-user-friendly-search-51e5f78f5a1e>

4.16 A Designer's Guide to Accessibility and 508 Compliance

<https://www.viget.com/articles/a-designers-guide-to-accessibility-and-508-compliance/>

4.17 Plutchik Emotion Diagram

This wheel showcases the emotions as hue's of variability. It is a great framework for the Emotion Crafter Mini-Game. Users can be shown similar events and produce a hue of rage for example (i.e. annoyance).

