Milestone 2: CS37: Grade.io

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Section 1: Background

When the world experienced a pandemic, education was changed at all levels. We are now at a stage where young kids are having to attend their schooling over iPads and laptops, with zoom being the primary method of communication that they are familiar with. With this comes an entire slew of problems for parents, teachers, and students. An application like the one that we are building will attempt to solve a few of these major problems.

Our primary focus will be providing transparency to parents and teachers, so that students can be the most effectively taught in a remote environment. Many children are finding it difficult to adapt to such a new environment, let alone the time management challenges that parents are facing. Effective communication between parents, teachers, and students is the foundation of a more productive educational environment.

While many people are looking forward to a post-pandemic world where the world goes back to no remote learning, there seems to be more and more of a chance that remote learning is here to stay. Instead of waiting for that ideal post-pandemic world, it is more productive to make the remote experience the best it can be.

Section 2: Vision

Our vision is to provide full transparency to parents, students, and teachers, in order to build a productive remote learning environment.

2.1. Growth and Value Hypothesis

Growth hypothesis:

The idea is to give the power back to the teacher with visibility of struggling students. We will create a virtual classroom where students can raise their hands and wait in line for the teacher. This ensures that every student will get their questions answered in a queue format. The goal here is to make sure students do not get behind when attempting to learn material. Additionally, the program will allow a teacher to privately mentor the student. Learning remotely should not be detrimental to a students learning experience. Group settings can prove beneficial for teaching a concept, individual mentoring is often required to further reinforce the topic with different students.

Value hypothesis: What makes your product or service beneficial? The value hypothesis is a way to test whether your product or service really delivers value to customers who use it.

The aim of our application is to take all the functions of a physical classroom, and virtualize it. The system will allow for communication between students, teachers, and parents. Students will be able to communicate with their teachers regularly to ask questions and get help on certain assignments. Parents are also provided with the functionality to communicate with their child's teacher. Parents can check in with their child's teacher to inquire about their child's progress in the classroom. Parents need to be given the same type of transparency with their child's progress in school when learning remotely. Students will be able to communicate with their teachers publicly and privately. While in lecture, there will be opportunities for students to post in a public chat when they have questions about the material that is being taught. These questions will be public and visible to all other students in the class. A private chat between students and teacher will be available for students who do not wish to have their questions seen by the whole class. This private chat will be extended outside of the classroom for students to access while they are at home. This will allow for students to receive homework and test preparation help. Lastly, metrics will be provided to parents and teachers. Parents and teachers will have the ability to see how long their child has spent on each homework assignment. Teachers will be provided with the ability to see how much time a student spends on each problem in a homework assignment. These metrics will give teachers insight on what homework assignments were most difficult for students, as well as seeing which concepts from each homework gave students the most trouble. Teachers can then use this information to reteach topics if necessary.

2.2 Also, please list some high-level requirements, as articulated by your project partner. These would include:

Functional requirements.

This project will allow students to complete homework assignments online, while keeping track of the time spent on each problem, as well as the assignment overall, and create a report that teachers are able to view. It will show if the student is falling behind, and on what topics they are struggling with. The system will rely on third party systems to provide key functionality, such as metrics, hand raising, standing in line, and gaining individual attention. Students should be allowed to raise their hands within the app, have the teacher be able to answer their question while still teaching. Students and teachers will also be able to converse with each other, and participate one-on-one zoom calls together. Parents will also be given the ability to see their child's metrics, as well as the status of their assignments (missing or complete). In addition, the parents will have the option to converse with teachers through their preferred form of communication.

Non-functional requirements

       With the data obtained through the students' completion of assignments, the system should be able to analyze it, and find the bottom 5 or so performers. These students, their parents, and the teacher, will be alerted to the fact that they have struggled significantly in the class based on their overall metrics. The teacher will be given visibility into a student's assignment grades, calculated times, and all other information gathered over the course of the class. The teacher will also be notified if a child was struggling on an assignment, and list which problems they spent the most time on. Finally, the system will allow for both public and private communication between students and teachers, so that other students will gain information from an open forum communication, while also allowing for private messaging.

Section 3: Prioritized Project Constraints

TIME:

This project was a completely new idea that our client had. As such, the team is building this application from the ground up. While this allows us a lot of flexibility for how much development the application goes through, it also potentially requires a lot of time investment on the part of team members.

Like other capstone projects, this application is subject to the 9 month timeline. While this capstone is going on, each of the team members will also be engaged in finishing up their degrees. In order to keep this project on a good pace, it will be important to keep to the sprints that the team has planned. For more specifics on this, see Section 5 of this document.

Currently, the team is meeting twice a week with the project partner. Additionally, team meetings without the project partner happen twice a week also. Overall, each team member will have an average of seven hours as a weekly allowance (this is not including meetings.)

As stated, this team will mostly be limited in time constraints by the 9 month timeline that all senior capstones already have set forth for them. If the project is more challenging than previously thought, the weekly allowance of time put towards this project might increase. The team fully expects to be flexible on this subject, especially because the plan we have right now is subject to change as circumstances change.

It is important to note that our project partner will not be wanting to continue this project with another senior capstone team after this current team. Essentially, he wants the team to take full responsibility/ownership of the project. However, if the team is so inclined, the project could always be developed post-capstone ending.

RESOURCES:

Our team is aiming to find all of the applications/resources that we need either through Oregon State University, or through free student versions. There are some resources available, such as xCode, Flutter, and Swift that are completely free, even without being a student.

Our project partner has also provided us with access to Okta, which is a security identity management software that will allow us to bypass a large portion of building the applications login interface. Consistent communication with the project partner will insure that if any other useful resources are available for free from the project partner, they are made use of.

The team has also created a research-discoveries channel on discord with the express purpose of keeping up to date on any free resources available to the team that might be helpful with this project. This shows our general attitude towards resources, that we want to make use of the best available to us without having to spend any money.

SCOPE:

It is important to first reiterate that this project and the current plan we have for it set in place is very flexible. The project partner has made it clear that this project is mostly the team's passion project, and while it does need to have a certain amount of development done on it, the rest of it is up to the team's decisions. This being said, the application has incredible potential to succeed in today's atmosphere, and the group is very enthusiastic about it!

In order to keep our scope up to date, there are bi-weekly meetings set in place with the entire team and the project partner to check in. This ensures that as the app progresses through it's sprints, the project partner is kept apprised of all major decisions, and can have input on which functionalities are highest priority.

Because this application mainly aims to provide communication between all of the parties involved in children's education, there may be certain functionalities that would ideally be implemented if there was more time, but cannot be in the brief timeframe of this project. These can be outlined in the final presentation to give an overview of the full potential of such an application if there were more features integrated into it.
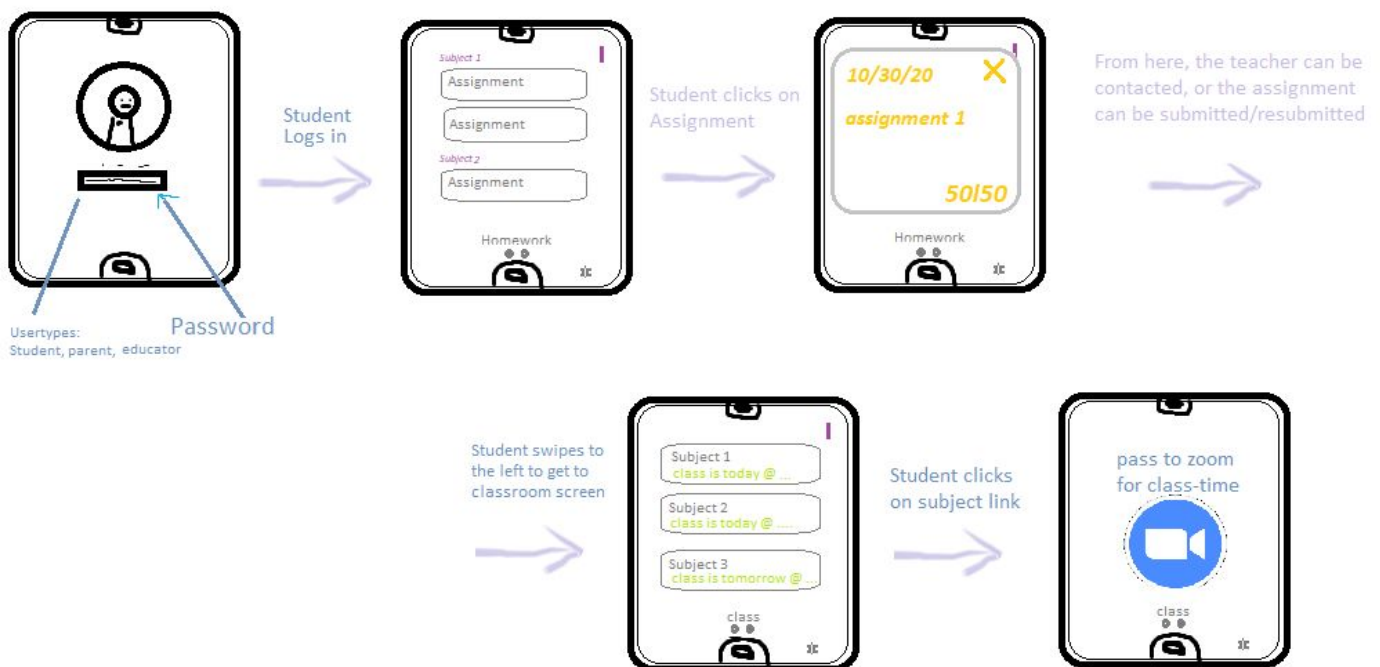
Section 4: Scope

4.1 Process Flows:

Parent Experience
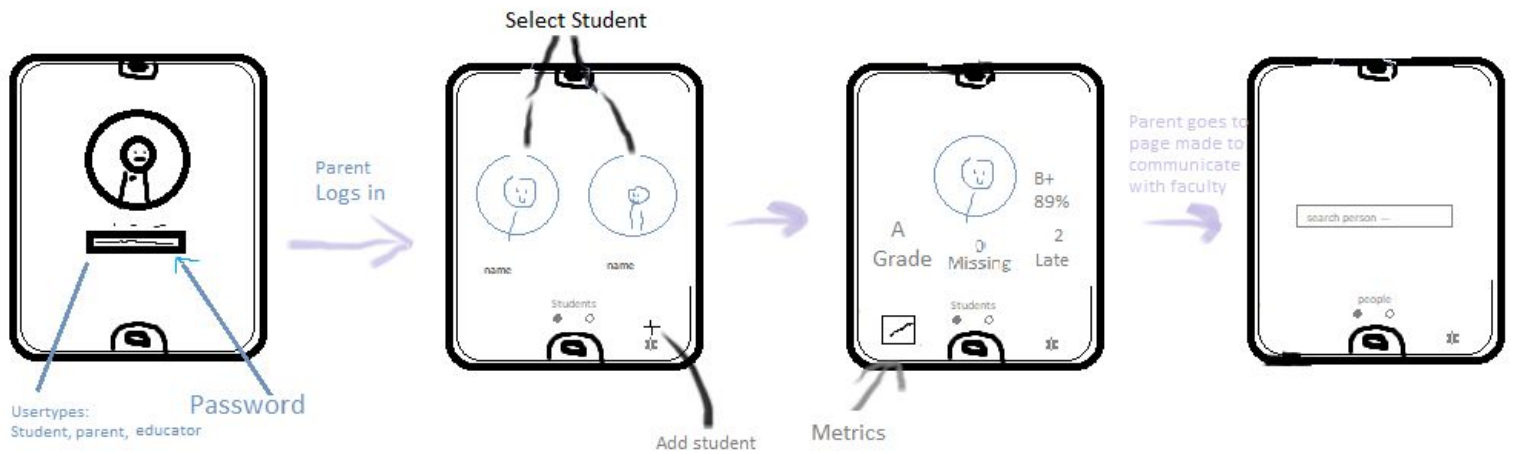
Student Experience

Educator Experience

4.2 User Stories:

1. As a student, I need a remote classroom environment that will feel more normal than other methods currently available so that I can be as successful as possible.
2. As an educator, I need an application that keeps track of student progress, allows me to import, edit, and grade assignments, and communicate with those involved in the education process so that I can effectively do my job.
3. As a parent, I need to know how my child is doing in class, if there are any missing or late assignments, and a way to communicate with educators and administrators so that less stress is put on parents and students to fill in the gaps of remote learning.
4. As a stakeholder, I need an application that puts the responsibility of teaching back into the hands of the teachers to promote a smoother remote learning environment.
5. As the development team, we want to provide a remote learning environment that reduces the stress we currently see in parents, educators, and students working within the current methodologies so that each type of user feels confident in whatever they may be responsible for.

Section 5: Iteration Plan and Estimate

Sprint 1: 5%

- Get our Mac development environment set up, and familiarize ourselves with xcode and Swift
- Back-end database chosen
- App workflow diagram
- Sign-in ability through Okta
- Nail down the way we will incorporate file upload for assignments

Sprint 2: 10%

- Create a design mockup/prototype
- Create a bootable application that is possibly connected to Okta
- Complete architecture diagram
- Begin formation of back-end database
- Compile necessary API's/outside info

Sprint 3: 15%

- Research assignment metricing, and how to implement it into our system
- Make general structure of our app (our different pages, and switching between them)

Sprint 4: 25%

- Implementation of messaging between teachers, parents, and students
- Importing of assignment files
- Canvas-like quiz creation for homework

Sprint 5: 25%

- Assignment time tracking
- Viewable metrics by teachers and parents
- Assignment status

Sprint 6: 20%

- Incorporate zoom hookups, possibly customize given UI
- Create UI for classroom structure