



CSE 440 – Task Analysis

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Problem and Solution Overview

The Seattle K-12 school district is fighting an attendance crisis right now. The mayor of Seattle launched a campaign called “Be Here, Get There” to improve K-12 graduation rates. In order to help the school district battle the attendance issue, we propose to enhance the current high school attendance interface by adding tools and analytics that will help with classroom engagement. The primary tool will be a communication platform that allows teachers to send words of encouragement or reminders to students after class has ended. In addition, an analytics platform will allow the teacher to view per student engagement data and target the students most at risk of being truant.

Task Analysis Questions

Who is going to use the system?

The system will be primarily used by middle school and high school teachers in the Seattle area. Based on our findings in the contextual inquiry, the attendance offices would also be able to use Motivata to input reasons for absences.

What tasks do they now perform?

From the contextual inquiry, we learned that teachers currently mark attendance and input grades for students using ESIS, the district-wide standard program. They mark anyone that isn't there and later input the absences into the system, usually after class. The system also provides student images.

What tasks are desired?

We want teachers to be able to mark attendance, but also visualize trends in their students' attendance, participation, and grades in order to measure their engagement. The teacher should also be able to compare these figures to aggregated data for their class, the state, or the nation. Secondly, our application will provide a communication tool so teachers can send encouraging text messages or emails to students and parents, or messages with related real-world applications of concepts learned in class. Finally, we will provide a set of tools that teachers may choose to use when they want to engage their class, including random facts or puzzles and a pseudo-random name drawer for raffles.

How are the tasks learned?

The application is meant to be very intuitive and easy to learn, so tasks are learned through natural exploration. In addition, we will follow the best conventions of similar tools such as ESIS and messaging applications to make it easier to pick up.

Where are the tasks performed?

We imagine that the majority of the tasks will be performed on the teacher's classroom computer either during the class or afterwards. However, since the application can be accessed anywhere, the teachers could open a browser at home and log in to complete tasks there if they wanted.

What's the relationship between customer & data?

Teachers input data about attendance, which is propagated back to ESIS. Later, teachers are able to view data pulled from ESIS in a visual form, as well aggregated data at the class, state, and national levels. The data will be stored on the school district's servers for access by attendance offices and teachers.

What other tools does the customer have?

The primary tool is ESIS, which handles the grades and attendance input. In terms of visualization tools, they would have to put the numbers into Excel and graph it manually. The additional tools Motivata provides like the fact of the day could be found by searching Wikipedia.

How do customers communicate with each other?

Teachers do not use the application to communicate with each other, but they do use it to send quick messages to students and parents. They can choose individual students, or select groups as recipients.

How often are the tasks performed?

Attendance is marked every day, participation is taken every time a student participates in class, and students' grades are often updated. The other features in Motivata will be used less often. The frequency will vary greatly on teacher preference and style. Some teachers may send encouraging messages several times a week; some may only use it to reach out to students who have had multiple absences in a row. Some teachers will like the fact of the day and use it to start class.

What are the time constraints on the tasks?

Attendance taking needs to be as streamlined as possible, because we don't want to consume valuable teaching time with an administrative task. Other tasks such as viewing and comparing data or sending a message should be quick as well.

What happens when things go wrong?

When things go wrong, we will show useful error messages to tell users what go wrong. For example, if something doesn't work, a friendly error message such as "We can't find that data right now" or "The message did not send. Please verify the phone number and try again later" should appear. If we were really implementing this, we would also include a feature to report a bug or error to the developers.

Revised Tasks

Send an Encouraging Message

After feedback from the contextual inquiry, it was obvious that the communication feature is the most important aspect for this application. There are three ways that teachers would like to use the platform:

1. Send positive reinforcement messages such as, "Nice job today."
2. Send a heads up for what the class will be covering in future.
3. Send reminders for tests or homework.

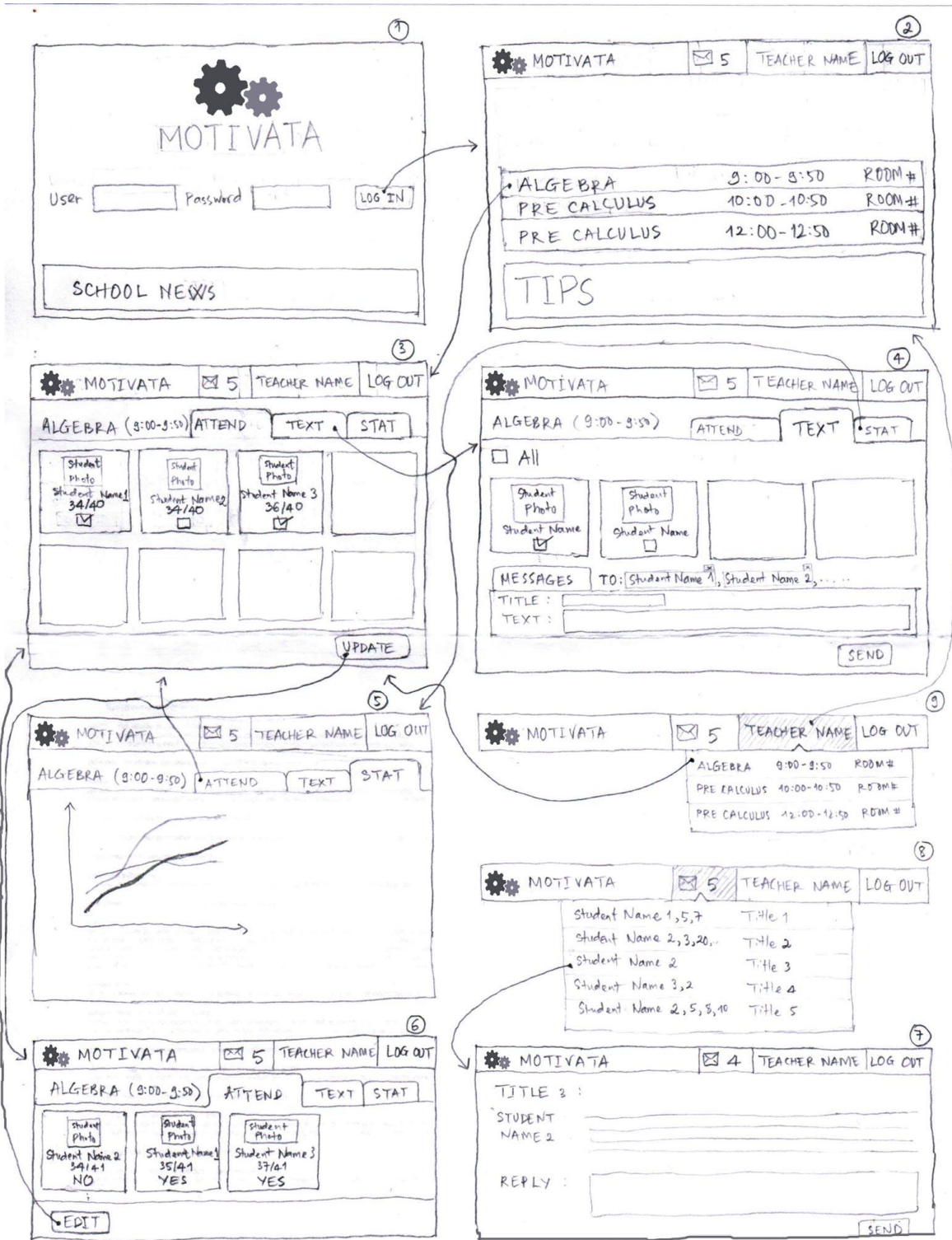
Review a Student's Attendance Record

After learning about the ESIS system, we wanted to build an application that provides the relevant data, since it already exists. For example, on the landing page of Motivata, we will pull in the picture data stored in ESIS to create a class grid view. When a student is clicked, then other ESIS information will be pulled such as the grades and student number.

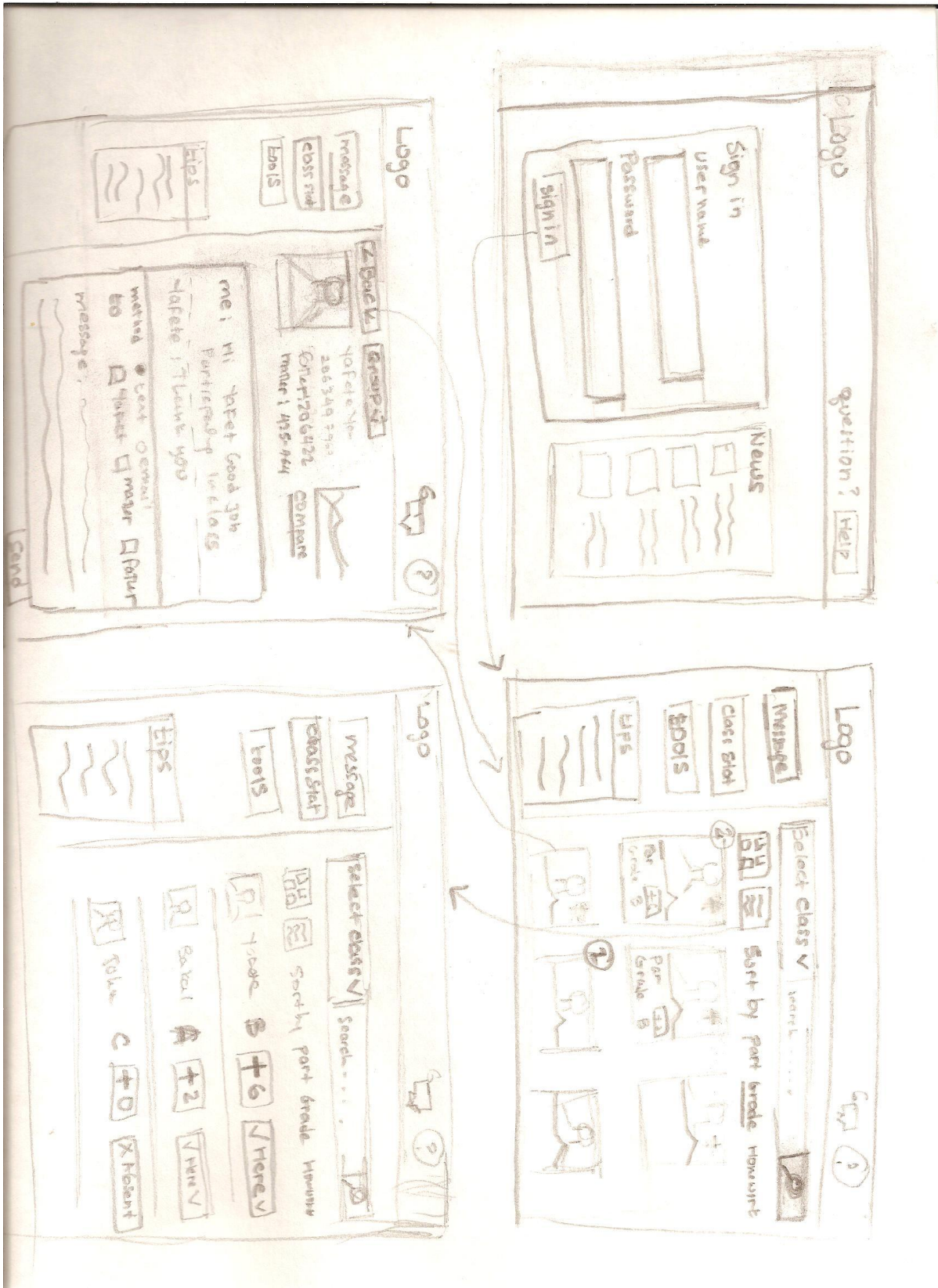
Alert Class of Tomorrow's Topic

One of the lessons we discovered from our contextual inquiry was that teachers need to quickly mark attendance and address the whole class. The focus in this task is to make class wide teacher communication faster. Both reminders and a heads up would provide options for sending to the class whereas the encouraging comments would be more individual.

Storyboards

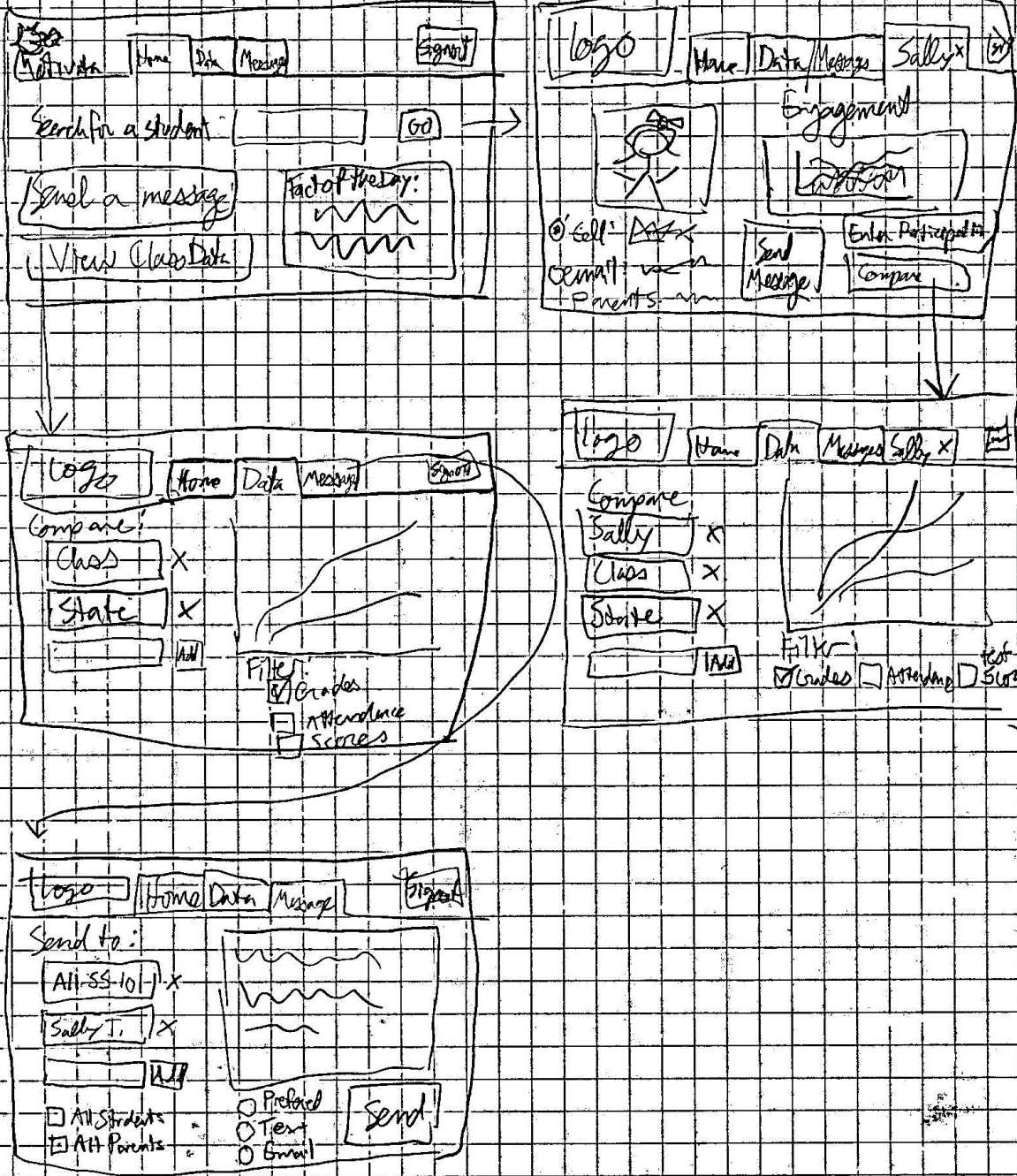


Design (Figure) 1: Class focused landing page and tab centric design



Design (Figure) 2: Student focused landing page with side bar design

Interface Ideas - Motivata



Design (Figure 3): Focuses on statistics and comparing students.

Selected Interface Design

Which Design & Rationale

We wanted to make a classroom engagement system that was simple, easy and usable for teachers. Our team was lead to believe that Design 2 would be the best interface design for this. The reason for this is because Design 2 made it simple and easy for teachers to interact with students and parents, while displaying all necessary information about all students all in one single page. This helps teachers locate a specific student quickly and view participation, grade, and homework without having to redirect to a different page. If a teacher wanted to view more detail on a specific student or even message students it's just it's a click away.

Design 2 provided the ability for teachers to increment participation during class by simply clicking on a button. This is essential because we don't want teachers losing focus on the class that they are teaching while trying to track participation.

Considering the fact that it is hard to know which student are not doing well in class, Design 2 made it easier for teachers to visually track students that are in need of help. Students at risk for truancy or academic probation are highlighted with different colors.

Functionality Summary

- The system will provide communication tools for teachers to send students and parents text or email alerts.
 - Positive reinforcement alerts praise students for good work, or say they were missed if absent.
 - Reminder alerts can be used to let, for example, students who have been out sick know that important due dates are coming up.
 - Relevancy alerts share what topics are coming up, and point out an interesting, real-world application.
- Motivated will allow teachers to view all students with their overall course grade, participation, and homework grades all in one single grid view. This allows teachers to sort students by different categories such as participation and grades.
- The grid view will have different colors marked around students to allow teachers to quickly differentiate students whose absences or grades put them at risk for truancy or academic probation.
- The system will provide data visualization of student participation, attendance and grades over time and similar visualizations compared to other students across aggregated national data.

- Teachers will be able to mark attendance, and also input participation for each student via one-click.
- System will also display random facts or joke that teachers can choose to use as a beginning to class each day.
- Motivata will have a classroom engagement tools section where they can find a fact of the day, challenging puzzles, or perform a raffle to select a random student.
- If a student or parent replies to a text or email received from teacher, Motivata will have a conversation thread on each student. If a student or parent replies to a text or email the Motivata will notify teacher with a new message has been received.
- The system will be open to future mobile development to allow teaches to interact with students via mobile devices.

Interface Description

As a teacher points her browser to Motivata, she will be promoted to login with a username and password. Once a teacher has logged in, she will be presented with the landing page view of Motivata. This view has three main sections: a header, a right menu, and a content area.

The header section of the interface is similar to Facebook's header. The teacher will receive notifications if there are any messages from the students. If there is a number that appears on top of the notification icon, the teacher can click on the icon to view the notifications as illustrated in Figure 4. Clicking on the notification will lead to the specific student's profile. The other icon on the header section is for help. If a user clicks on the question mark icon it will bring up the documentation on Motivata.

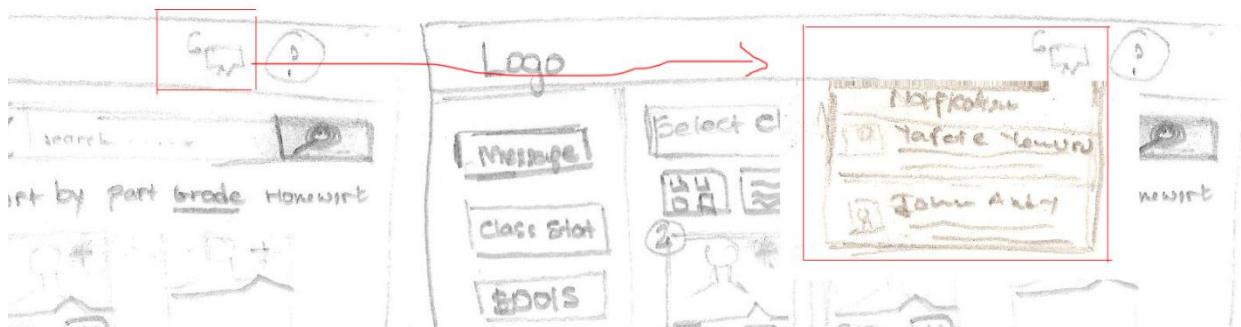


Figure 4: Message Notifications

The right menu allows a teacher to create a message, view class statistics and to check out other tools. Clicking on the Message icon will direct the teacher to compose a new message. Once there, the teacher can select who she wants to email and send the message. The class stats button will direct users to view the statistics of the class. The tools button will direct users to view others tools and third party applications.

The content section is the heart of the interface. It displays all the teacher's students. The teacher can browse through the list or search for a specific student by typing in the search bar. If the teacher is only interested in viewing a specific class, she can select the class by clicking on the select class drop down as seen in Figure 5.

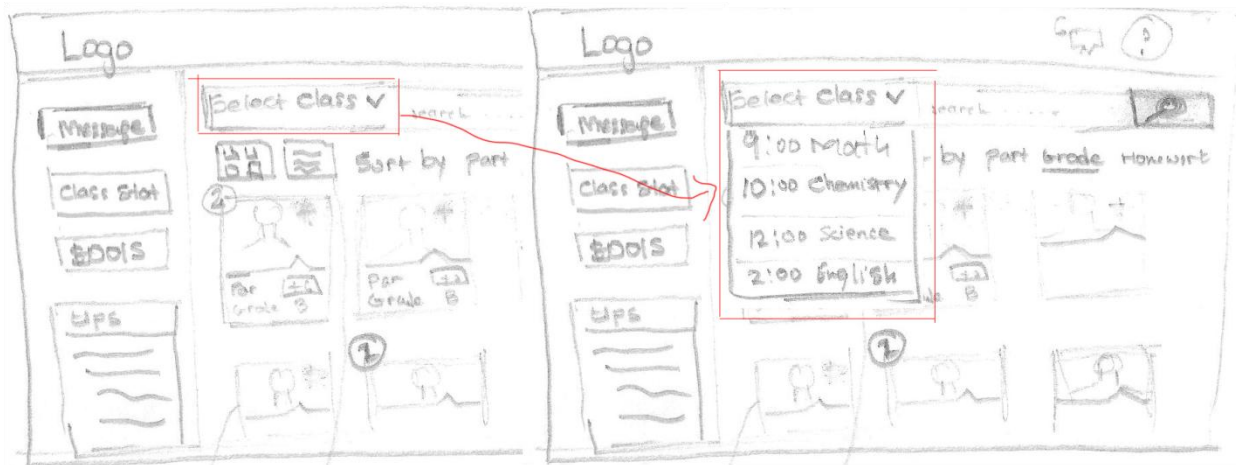


Figure 5: Selecting Class

Once a user selects the class Motivata will filter the database to only display the students in the class that is selected. The teacher also has the option to view students by grid or list view. The teacher will have to click on the icon that looks like a grid to display students in a grid view or click on the icon that looks like a list icon to display list view. This is illustrated in Figure 6. The list view is shown in Figure 7.

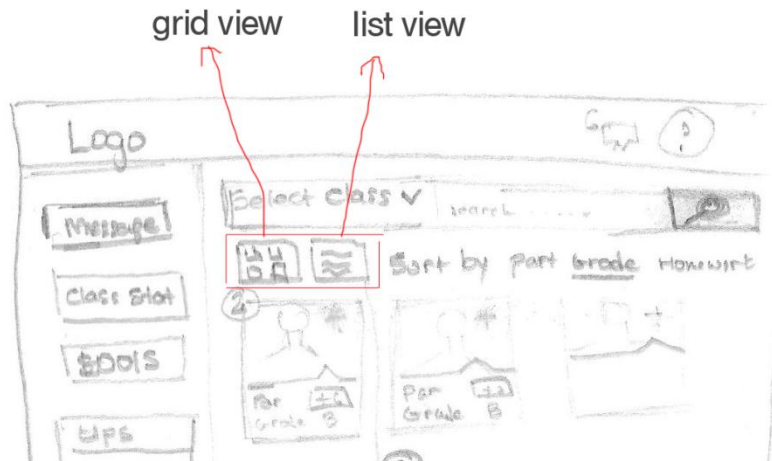


Figure 6: Grid and List View Choice

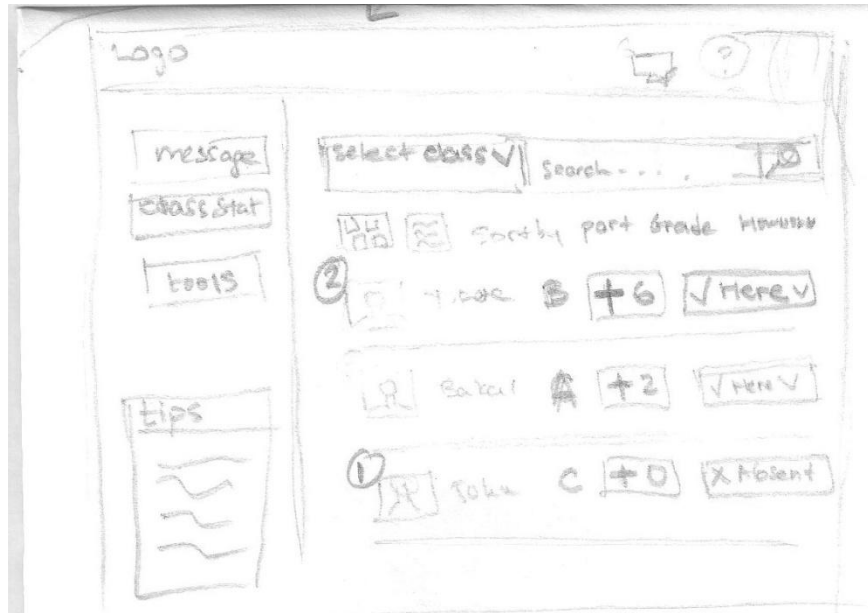


Figure 7: List View

By default, the students will appear sorted in alphabetical order. If the teacher wishes to sort students by participation, attendance, or homework they can click on one of the links below the search bar. This is helpful if a teacher wants to send a message to a student with the most participation.

The interface also has a message notification right on the mid display (this notification mirrors the header notification). If student's writes to a teacher, there will be a number notification that appears on top of the student's image. This is shown in the image below.

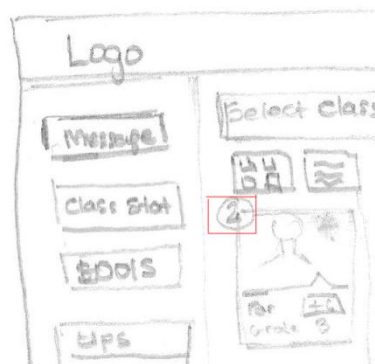


Figure 8: Grid View Message Notification



Figure 9: List View Message Notification

Inputting participation in Motivata is made easy. As seen in Figure 10, if a teacher clicks on the participation + sign, student's participation is automatically incremented.

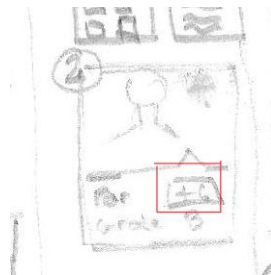


Figure 10: Grid View Participation

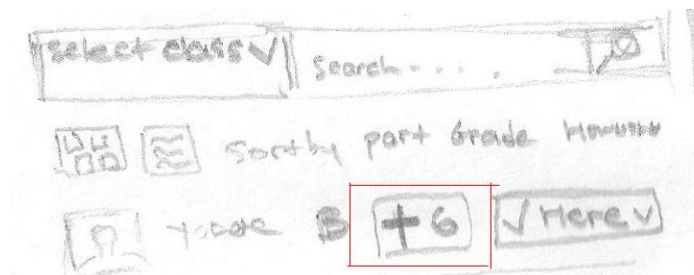


Figure 11: List View Participation

Marking a student absent is made easy with Motivata. By default students are marked attendant and the teacher is supposed to mark the students that are absent. To do this the teacher will have to click on the attendance button that is placed on top of the student's image on the grid view or at the corner on the list view. Once the teacher clicks on the attendance button the state will change to absent or present. This is illustrated in Figure 12.

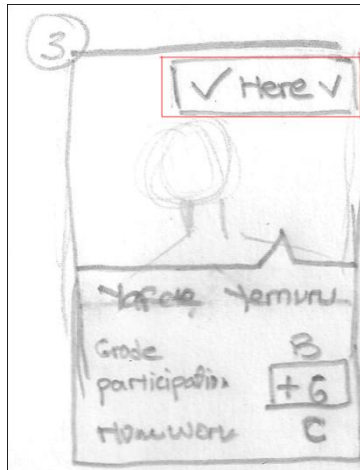


Figure 12: Grid View Attendance

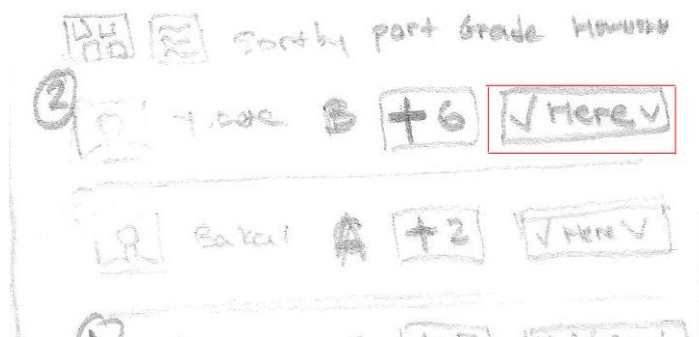


Figure 13: List View Attendance

The interface will have different color notification for students at risk and students that are doing well. This will be better illustrated in the low-fidelity prototype.

Scenarios

The scenarios below demonstrate how a teacher can use Motivata to further understand and engage the class. These scenarios are a result of the feedback we received from the contextual inquiry results.

Send an Encouraging Message

Amanda is a seventh grade social studies teacher who loves teaching. She’s been a teacher for the past two years so she still has much to learn, but she understands the latest technology well. Billy is one of her most truant students. Sometimes Billy comes to class and even when he does, he is the first one to leave so Amanda doesn’t get the chance to talk with him. She really wants to have a way to engage students when class isn’t in session.

Amanda hears about Motivate from her best friend and wants to give it a try to send Billy a message when he comes to class for the day. After she is done teaching for the day, Amanda logs into Motivata and finds Billy's student picture on the landing page. She clicks it and is presented with Billy's record. She clicks the "Messages" tab and then types the message, "Billy, thanks for coming to class today. You had a great answer for question 2". She clicks send and the text message is sent to Billy's phone. He's currently playing video games and sees the message. He realizes that Amanda cares that he shows up to her class. Billy promises to show up more often from now on.

Review a Student's Attendance Record

Mr. Rogers, the language arts teacher at Roosevelt High School, has had a busy day. Two of the students, John and David, were too lazy to go to the water fountain down the hall so they drank water from the class fish tank. David didn't feel well so he had to be sent to the nurse's office. Mr. Rogers just got home, but he wants to check David's grades and attendance to see if missing class will be an issue.

Because Mr. Rogers uses Motivata, it's easy for him to check David's information online. Mr. Rogers logs into Motivata and clicks David's school image on the landing page. A page of general student information pops up and he is able to check David's grades. The graph shows steady good grades since the beginning of school and consistent attendance. It looks like David is doing well so missing a few days of class shouldn't be an issue. Whew!

Alert Class of Tomorrow's Topic

After all the students have gone home, Happy is preparing for tomorrow's class. She thinks about what happened during the day and what to improve upon for tomorrow. All of the sudden, she remembers a great article she read about a breakthrough in genetic research. The class is learning pundit squares tomorrow, and the article's a perfect example of how they can be applied in the real world.

Good thing Motivata allows her to notify students about tomorrow's class. She logs into Motivata and clicks the "Send to Class" button. She types the message, "Hello Bio class, we're doing pundit squares tomorrow! Check out this article on the latest in genetics. That'll be you guys in no time." and sends it. The students all see the message and are intrigued. The students are also a little more prepared because many of them read the article and quickly searched Wikipedia for what pundit squares are. They feel excited to know they are learning relevant information instead of doing busy work.