Project Jam Protothon 2020

Lookout

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Problem Overview/Validation & User Group Prioritization

Educational institutions have long been plagued by a lack of student engagement and chronic absenteeism, and it is estimated that around 15% of all students in the United States were chronically absent even prior to the onset of the COVID-19 pandemic **[7].** In fact, a survey of 5 million students ranging from grades 5 through 12 showed that student engagement numbers dropped sharply from 74% in grade 5 to less than 50% by grade 10. In contrast, students with higher student engagement numbers reported 2.5 times higher grades and were 4.5 times hopeful of future prospects [7]. These problems, in general, find their roots in factors including academic disengagement, socioemotional distress, economic challenges, and health problems [9], and educational institutions have long found difficulty in addressing them. Unfortunately, these issues have been exacerbated by the COVID-19 pandemic and the transition to a virtual learning environment. This virtual learning environment has impeded student learning, negatively affected the holistic development of students, and decreased the prevalence of equitable education [4]. Research has also shown that the negative impact COVID-19 has had on socioemotional learning has led to deterioration in student test scores and behavioral outcomes, and these kinds of losses are felt most heavily by middle school students [11].

Although most students across the country have experienced educational problems associated with virtual learning, we have decided to focus on **low-income Black and Hispanic students**, who are the most severely impacted by this transition, for a number of reasons. It is estimated that on average, this subset of the overall student population loses approximately 12 months worth of learning, which is 5 months more than the average student, when forced to learn virtually from March 2020 to January 2021 (Exhibit 1) [3]. This significant disparity can be attributed to factors such as increased isolation, lack of socioemotional support, and absence of an authority figure to constantly monitor educational progress [5] [6]. One of the most critical opportunity gaps, however, is the uneven access to technology and internet access, both of which are essential for an online learning environment. A significant 25% of low-income 8th graders lack access to a laptop or desktop at home, compared to the 16% lack in the overall 8th grade population [4]. Research has shown that this kind of educational disparity can affect long-term economic outcomes as well. Because of the unevenness in education outcomes, low-income Black and Hispanic students are projected to lose a higher proportion of their lifetime earnings (between $61k - 82k) due to learning loss compared to the rest of their peers [3]. Across the entire K-12 cohort, estimated lifetime impact points to a earning loss of $110B and a US GDP loss up to $271B by 2040 [3]. During this critical time, we must work on minimizing the educational and socioemotional losses exacerbated by the COVID-19 pandemic and focus on those that need help the most - young low-income Black and Hispanic students.

User Pain Points

The strongest pain points for middle school students struggling with engagement in their virtual classroom range from a simple lack of in-person support for social anxiety, to guidance when it comes to adjusting to a new environment [8]. These problems are amplified for low-income minority students, especially those whose parents have low job security or irregular work schedules, and lack adequate support from their family to compensate for the loss of an in-person teacher [4]. Even for the parents who have the time and energy to sit with their child throughout their virtual school day, some are unsure about how to effectively teach the material or explain approaches to homework questions. Students also struggle to build strong relationships with their teachers, and as a result they feel less comfortable asking questions in class and actively engaging in classroom discussions [8]. Bullying among peers is also a major reason that causes chronic absences. From a 2019 study, it is estimated that ~19% of children in grades 9-12 have experienced bullying on school property [12]. Missing school and losing interest in early grades can have a snowball effect, and sets up kids to fall behind in the fundamental reading and math skills they need to move on to more complicated work in later grades [8]. For instance, one Rhode Island study found that being chronically absent affects high school graduation rates and the chances of success in college, and that is important to tackle this issue early on in a student's education rather than later [9]. In particular, researchers found that only 11% of high schoolers with chronic absences made it to their second year of college, compared with the 51% rate of their peers who attended school regularly [9].

Proposed Solution Decision & Tradeoffs

To address the problem of low student engagement levels across the country, our team considered two product ideas at first: 1) a community marketplace for the exchange/selling of used technology and school resources, and 2) a platform that facilitates mentor-mentee relationships within school districts. Ultimately, we decided to pursue the latter direction for a number of reasons. From our secondary research, we found that cross-age tutoring and mentorship between students of different achievement levels have a direct impact on increasing student motivation and engagement to achieve classroom goals [1]. This type of mentorship was more effective and provided greater benefits for minority students and students who lived in areas of low socioeconomic standing [1]. For instance, a majority of low-income mentees experienced a greater increase in academic confidence and improvement in social skills [1]. Mentors and peer tutors can also benefit from the mentor-mentee relationship. They have the opportunity to make friends that extend beyond the mentorship period, and these mentorship experiences can help them build their resume for future careers [13]. A study that investigated the benefits of a peer tutoring program between older, high achieving students and younger, at-risk students showed that 87% of the younger peer's grades improved by at least one level after the program [13]. We also discovered in our competitor analysis that several mentorship programs already exist and are successful in solving the problem of low engagement student engagement rates (Exhibit 5).

Thus, we believe creating a platform that would help streamline the process of mentor-mentee relationships in a localized school district would help address user pain points such as student disengagement, and therefore also address negative outcomes such as chronic absenteeism and academic depression. This solution is made with the following assumptions: users have access to stable wifi and technology, students were attending an in-person school (not homeschooled) prior to the pandemic, and all users are located in the US. The benefits associated with our platform would positively impact three primary personas: middle school student mentees, high school student mentors, and teachers/administrators themselves (Exhibit 4). For mentees, the reception of mentorship might lead to better social and academic outcomes in terms of soft skill development [1], as well as better grades and test scores [13]. For high school mentors, they would have the opportunity to improve their social skills and build their resume [13], as well as make meaningful friendships in the process. As students become more engaged in the classroom, teachers would experience less of a burden when it comes to motivating students and making sure they are energized. In addition, as students start performing better in terms of grades and standardized test scores, their respective public schools may receive additional funding and build their reputation. This new funding, in turn, will improve educational infrastructure even further and lead to higher rates of student retention and engagement.

We also decided to pursue the mentorship platform idea because there were several risks in providing a community marketplace for used resources that deterred us from pursuing it. New owners of a second-hand device could have access to confidential data from the previous owners, which would lead to privacy infringement issues. However, the most severe harms a new owner faces are caused by malware that the previous owner failed to remove, or that the previous owner purposely installed to steal your data for defrauding [10]. Malware is also the primary reason for computers experiencing lagging and poor performance [2], which would cause decreased efficiency in virtual learning and further leading to lower classroom engagement due to increased technical frustrations.

MVP Feature Set & Tradeoffs

To reiterate, what we want to accomplish through our proposed platform is creating an accessible and efficient way for middle school students to receive mentorship and guidance from high school students in the same school district. If middle school students dealing with low engagement and social anxiety are able to connect with an older peer who might have gone through similar challenges or has advice to share, there is a promising opportunity to improve on socioemotional and educational outcomes, especially for low-income minority students who might not otherwise have access to an educated role model.

In the minimum viable product (MVP) for our proposed mentorship platform, there were several features and functionalities that we felt were needed to start testing with pilot customers and gather meaningful feedback(Exhibit 6). First and foremost, we need a profile-creation and onboarding feature for new mentees and mentors who want to join the platform. Students would first need to input basic information such as name and grade level, contact information, mentorship needs/offerings, interests/hobbies, and preferred contact methods. Next, students would be prompted to input their recurring weekly availability on a virtual calendar for the purposes of finding a mentor with some availability overlap. Mentors would also have access to some resources (articles, videos) regarding how to be an effective mentor and teacher to a younger student. Research has shown that training mentors beforehand actually increases the mutual benefit to mentees and mentors [12], and so we feel like this would be an important component to include in the MVP. At this point, we also feel like we don't need to flesh out a formal incentive system for mentees and mentors on the platform. If we observe that students are willing to participate even in the absence of platform-based rewards, it would be a great sign moving forward. Schools could also have some sort of informal incentive system, where participating in mentorship could provide benefits such as extra credit or volunteer hours. The actual process of matching would need to be manually done by a system administrator, which would most likely be a member of the teaching faculty or board. The administrator would be able to see the profiles of all unmatched mentees registered on the platform in the same school district, and then match mentees with mentors according to overlapping availabilities, interests, and mentee needs. We understand that the process of manually matching mentees or mentors requires effort on part of the administrator, but at the MVP level, we feel like we do not need to spend time automating this matching process right away. Lastly, we are including home portals for mentors and mentees to check on any upcoming meetings with each other and send messages to administrators, if necessary. We feel like this limited feature set is a good starting point, and will allow us to test hypotheses and validate demand for our platform. Once we establish this demand, we would then be able to focus on scale and additional feature building. To help us measure success, we also plan to send out post-meeting surveys for mentees and mentors to complete. They would receive an email with a link to a simple online form asking them a short series of questions relating to different aspects of the engagement that can be answered by selecting a face on a smiley face sliding scale. Two months after profile creation, mentees would also receive a more extensive survey to validate whether or not our product is actually helping solve the problem of classroom disengagement at the individual level.

KPIs & Metrics

Our product is designed to solve the problem of low engagement among middle school students learning virtually. The following metrics are intended to allow us to measure success on different fronts and implement changes as needed. Our primary metrics would include: **[1]** the after-meeting and monthly surveys should show that our users feel like they are benefiting from their mentorship, and **[2]** the number of completed meetups between mentors and mentees should indicate how incentivised and engaged our users are. Our secondary metrics would include: **[1]** the average rise in mentees' grades over time and decrease in missed days of class will verify that our product is solving the problem of low engagement in virtual classrooms, **[2]** the number of registered mentors/mentees and user traffic on our site (ie number of logins) will determine user engagement and demand, **[3]** how many of our after-meeting and monthly surveys are being completed will also show user engagement, and **[4]** the length of a particular engagement between a mentee and a mentor. We want our mentee-mentor matches to meet more than once and continue to develop their relationship, but we also understand that some students might show improved levels of engagement after only a few meetings. The length of the engagement should, on average, be greater than one or two meetings, but outliers are expected.

Go-To-Market Strategy & Monetization

In order to push our product to the market and monetize, our proposed plan is to target three main customer segments: **[1]** government programs that provide grants and funding to school districts, **[2]** corporate sponsors that have been known to fund programs or services at low-income schools, and **[3]** well-off private schools with a high proportion of their student body on scholarships or financial aid. Our

rationale is that these three groups would have a large enough budget to feel comfortable investing in new products such as ours, compared to public school districts who are often constrained by thin operating margins. We would try to convince these customers to sponsor/fund the use of our platform in local public school districts by enumerating the benefits that the platform would have for the schools, as well as the positive socioeconomic impact the platform would have on students. Our platform's pricing system would be tiered, and scaled according to the size of the student body in the respective public school district (our "end user"). This strategy allows mentees and mentors to use our platform for free, incentivising these user end groups and benefiting the students most impacted by the COVID-19 pandemic: low-income minority students who wouldn't otherwise be able to afford to pay for such a service.

Further Validation & Future Building

As we launch our platform in a few pilot school districts, we have the opportunity to gather meaningful feedback from mentees, mentors, and teachers/administrators themselves about the platform's ease of use and utility. The primary hypothesis we would need to validate at this early stage is whether mentees and mentors are inherently motivated to join the platform without a clear incentive structure in place. If we observe many high school students opting to become mentors and middle school students become mentees, we would be able to successfully validate the hypothesis and start building out new features that would further grow and sustain the platform's user base and scalability.

Following the MVP phase of our platform, we would need to start releasing "P1" features that would help with user experience and data collection. For instance, we could try testing functionality that involves mentees making an active selection from a shortlist of possible mentors. Giving mentees the choice of a mentor might improve satisfaction due to this increased autonomy of choice. Furthermore, we could develop virtual games or activities that mentors could engage in with their mentees during calls. We could also start building out a formal incentive system (with associated tracking infrastructure) where mentors and mentees would earn points from participating in calls and receiving positive survey feedback from their match. Mentees could redeem points for virtual rewards such as avatar costumes and accessories, and mentors could redeem points for coupons to popular food and drink locations. Tracking participation and point accumulation would also help with school-based reward allocation as well; for example, it would be easier for a high school to award a mentor with extra credit or volunteer hours if they have a tangible record of their past involvement with mentorship. At this point, we might also want to start developing surveys for teachers and administrators relating to any observable differences in mentee performance after joining the mentorship platform. This kind of feedback can be qualitative (observed changes in student behavior) or quantitative (improvement in test scores or grades), and it would help us understand the positive impact that we would be bringing with our product. To further improve user experience, we would also build a more comprehensive training program for mentors to be able to better help their mentees. Later down the line, as we continue to grow our reach across the country and manage increased scale, we would want to introduce a few features that would further improve the interface of the application and save time for users carrying out certain processes. For instance, we could build an audio-video interface directly within the application itself for mentors and mentees to have their calls. We could also build artificial intelligence models to automate the mentor-mentee matching process, and this would save a significant amount of time for administrators who would otherwise be doing this process manually. We could also incorporate machine learning (ML) in several parts of the profile creation process. For instance, when a user is filling out their interests and hobbies, a ML model could help provide suggestions to ultimately save time and improve the user experience.

There are many potential features we can build out and add to our platform, but this process needs to be iterative and reliant on user feedback and requests. We need to understand bottlenecks at every point in our various user journeys, and implement solutions with the goal of optimizing satisfaction and retention rates for existing users as well as making the platform more accessible and attractive for potential users. We hope that this product will be able to make a positive impact on student engagement, and thus improve socioeconomic outcomes in the short and long term alike.

Appendices

Exhibit 1 - from McKinsey & Company:

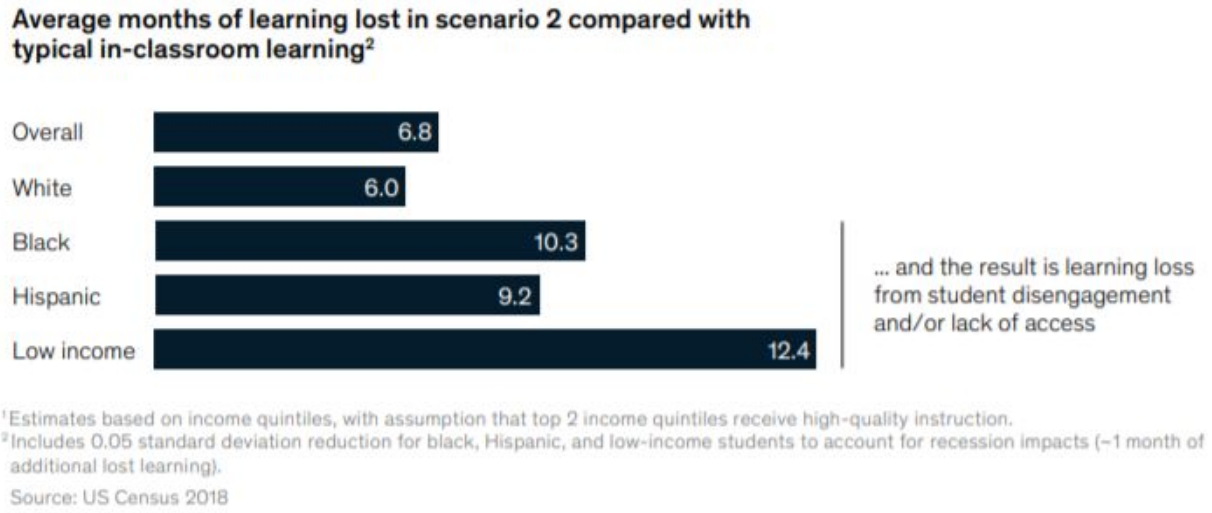


Exhibit 2 - from Toronto District School Board Study:

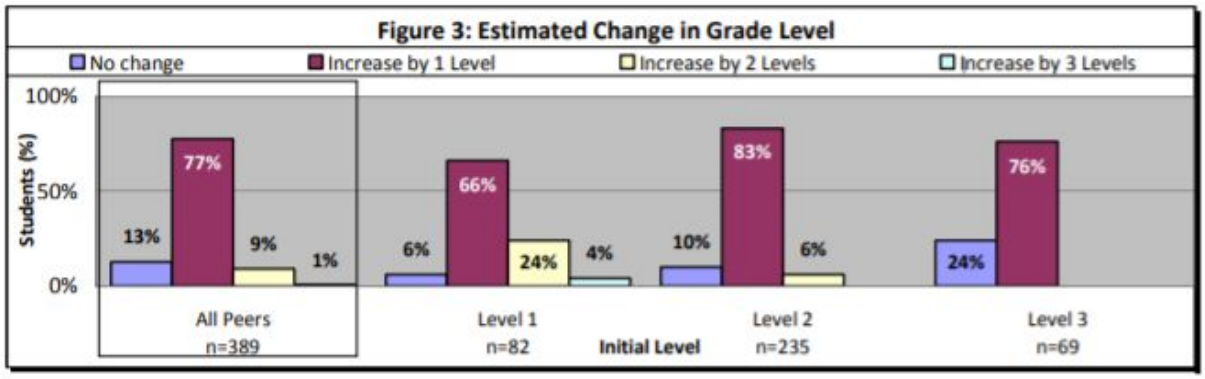


Exhibit 3 - Proposed User Journey:

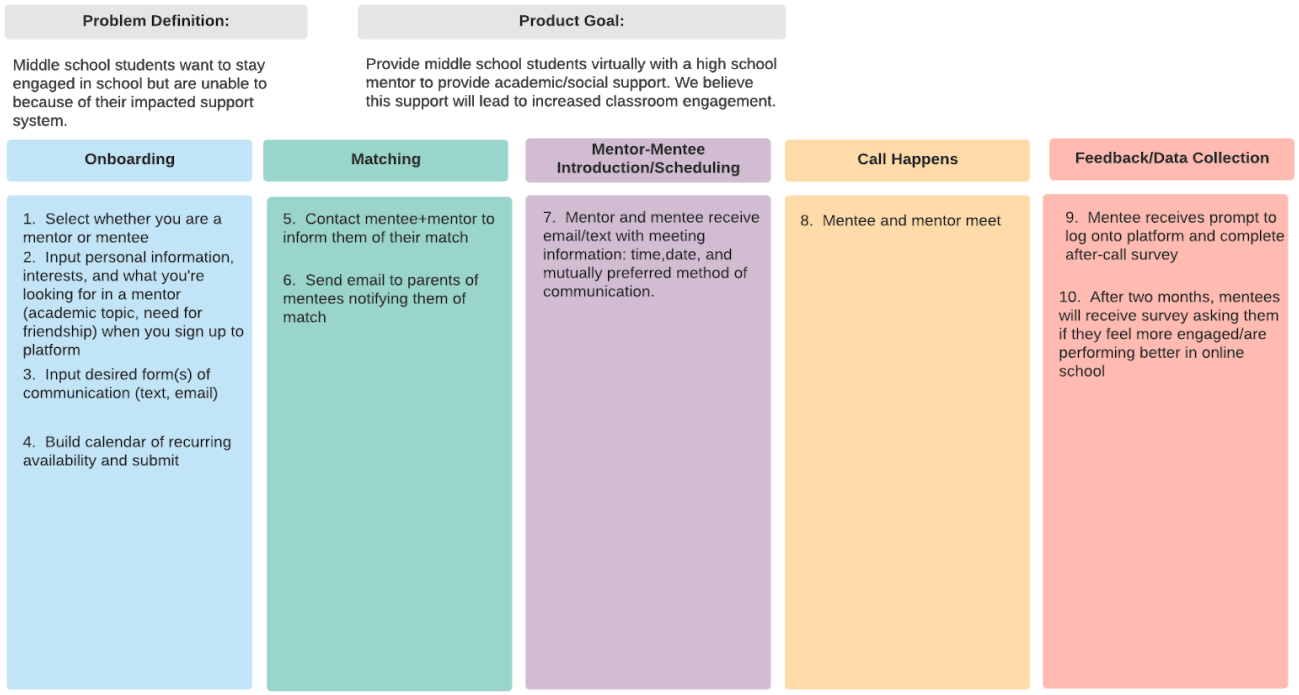
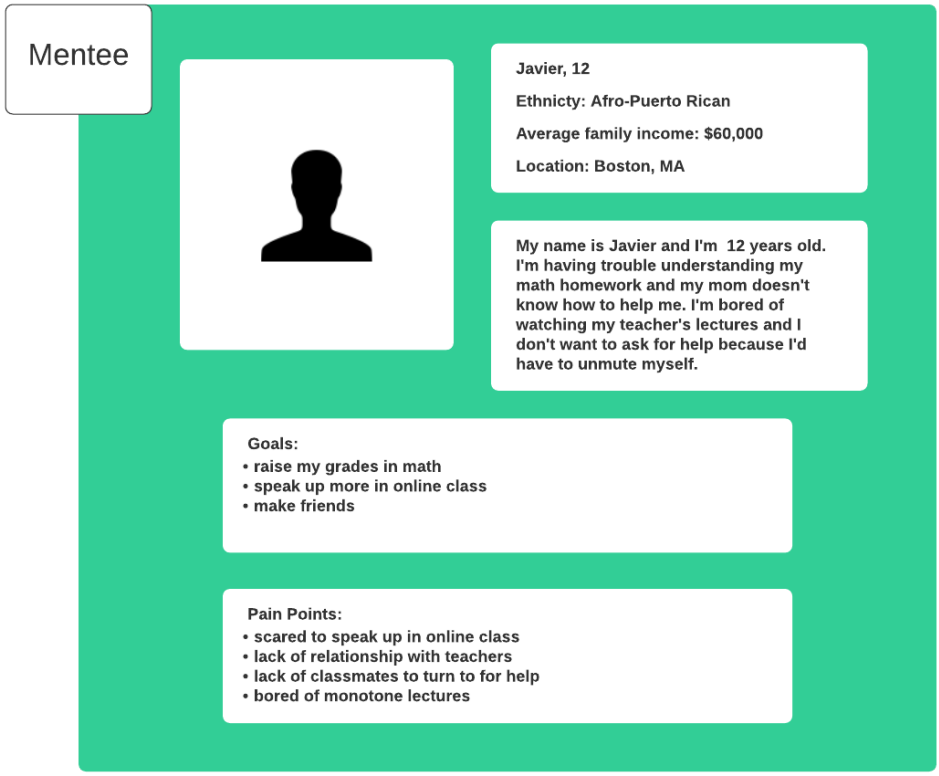


Exhibit 4 - User Personas:



Mentor

Michael 17

Ethnicity: Chinese

Average family income: $80,000

Location: Boston, MA

My name is Michael and I'm 17 years old. I used to coach a U-12 soccer team but now the team no longer practices. I'm looking for another chance to teach young students and socialize with my peers.

Goals:
- **teach younger students**
- **socialize with peers**

Pain Points:
- **can't meet in person to coach soccer**
- **no longer have peers to socialize with**

Teacher

Michelle, 48

Ethnicity: Caucasian

Average family income: $50,000

Location: Boston, MA

My name is Michelle and I'm a middle school math teacher. I'm having difficulty keeping my students engaged through online learning. I've started to notice their grades and attendance dropping.

Goals:
- **increase student attendence**
- **raise students' grades**

Pain Points:
- **can't build a strong relationship with students virtually**
- **students don't interact with their classmates as much, leading to poor classroom spirit**

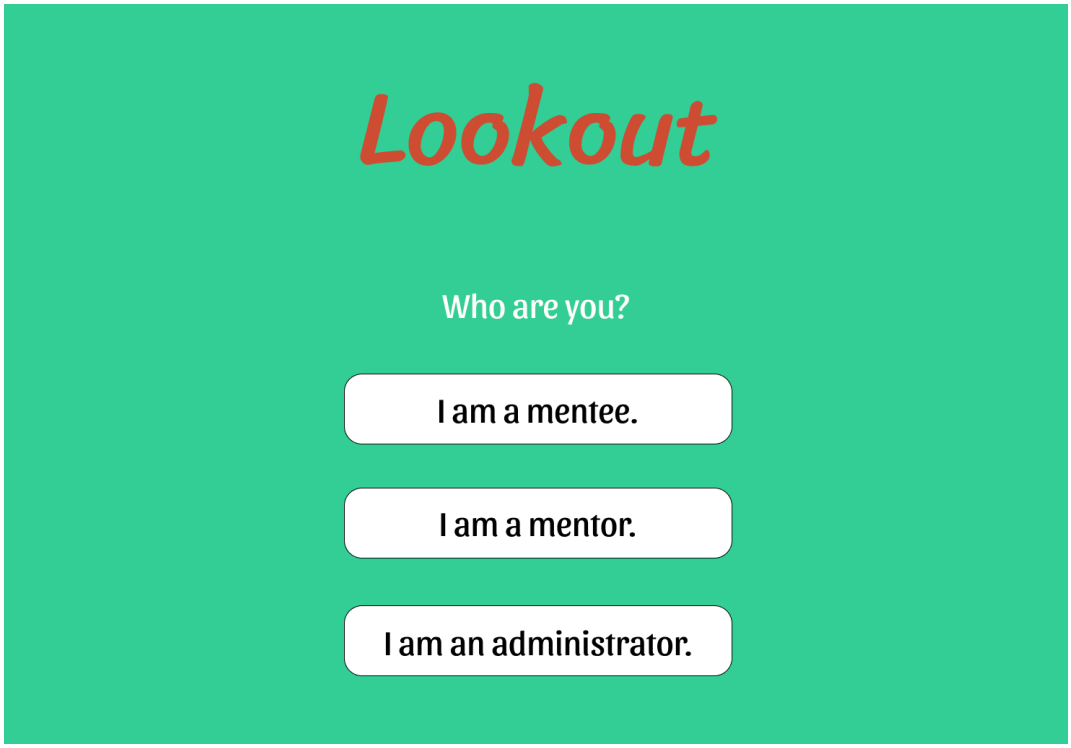
Exhibit 5 - Competitor Analysis:

	YouthAssistingYouth	Mentor	Tutormate
Type (Direct, Indirect)	Direct	Direct	Indirect
Target audience	Kids 6-15	2 groups (8-12,12-17)	1st graders (5-7 y/o)
Value Prop	Matching Mentor-mentee to help provide assistance to kids	Safe and structured curriculum-based correspondence model to match mentor with mentee	TutorMate provides the only global, volunteer-led, technology enabled remote reading support program.
Key competitive advantage	Experience with the mentor-mentee matching process. Founded in 1976.	A highly vetted mentor selection process with a coordinator guided communication channel.	Certified interventionist for focused learning.
Strengths	Extensive training process. Robust Our program uses a peer-mentoring model that matches youth-to-youth.	Localised mentoring practices, Coordinator selects the general topic to ensure relevance to mentee, Coordinator set deadlines to provide structured learning . COPPA compliant.	Training Softwares (TutorMate and TeacherMate) that guide the mentors.
Weaknesses	High turnaround time of >1 week for the matching process might lead to mentor drop-offs from the platform. No tutoring expected but can be a part of the mentoring process. 1 year commitment is required from mentors.	Mentee has limited say on the topic. Coordinator set deadlines may not be ideal. No video chat functionality. Less focus on holistic development of the mentee.	TutorMate relies on the availability and commitment of corporate professionals.
Opportunities (things the business can exploit to its advantage)	Could rope in teachers in neighboring schools to improve the matching process.	Scope to improve on the non-academic aspects of mentoring.	The learning platform can be modified to help assist with subjects beyond reading.
Threats (threat to this business)	Compliance with COPPA.	The increased approval process might lead to potential delays when the traffic increases.	Corporate professionals not taking their roles seriously leads to a drop in engagement.

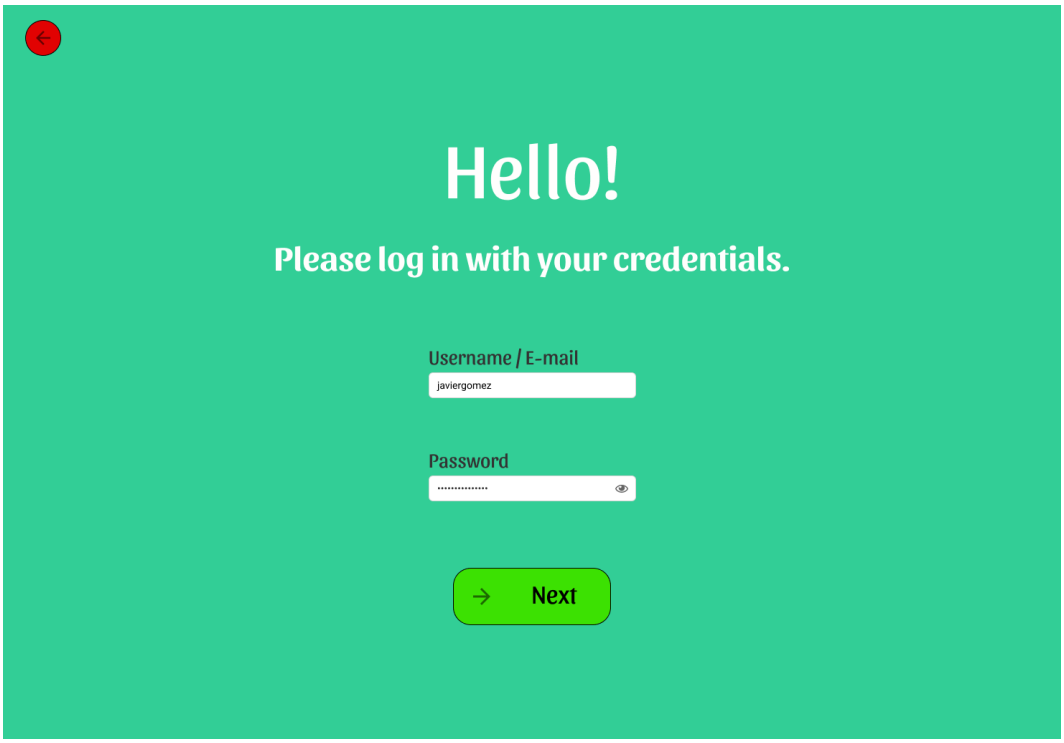
Exhibit 6 - Platform MVP Design Mockups

Login & Home Pages for Different Users

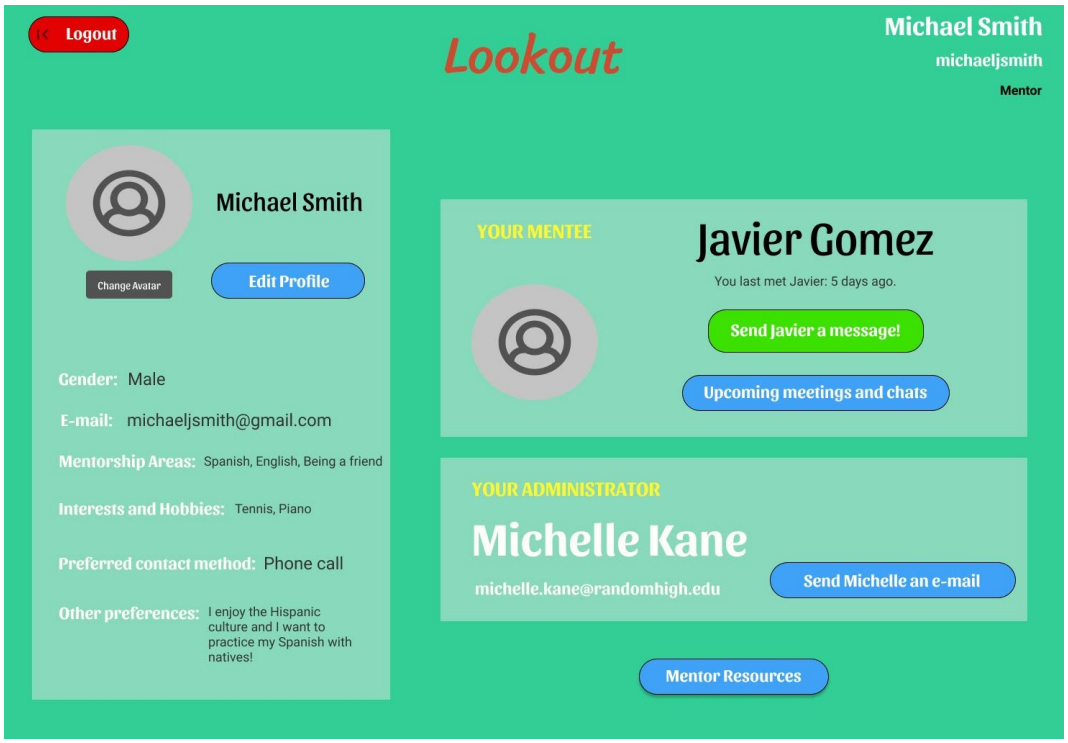
1) Start Screen for All Users



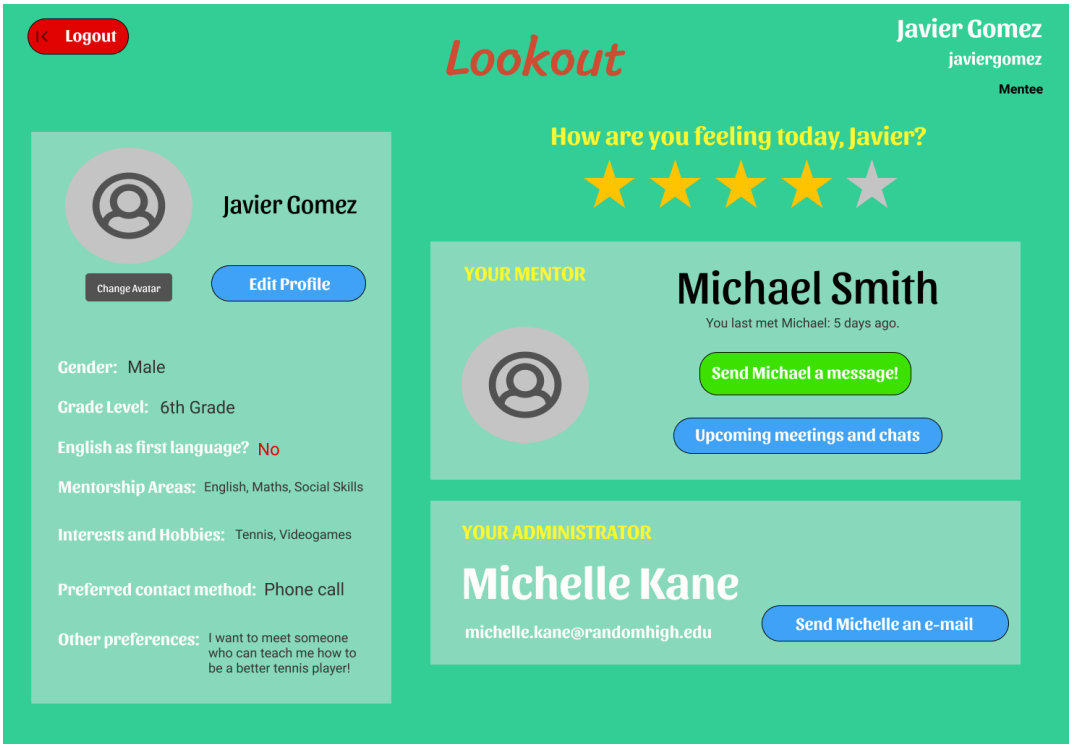
2) User Login for All Users



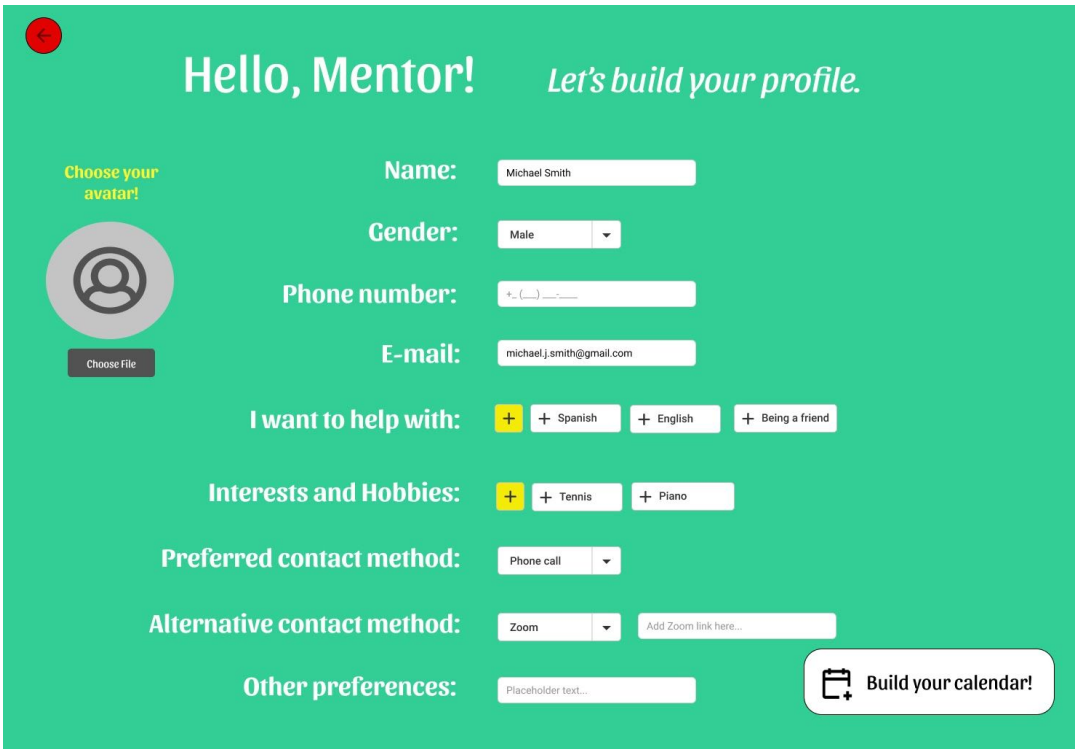
3) Home Page for Mentors after Logging In

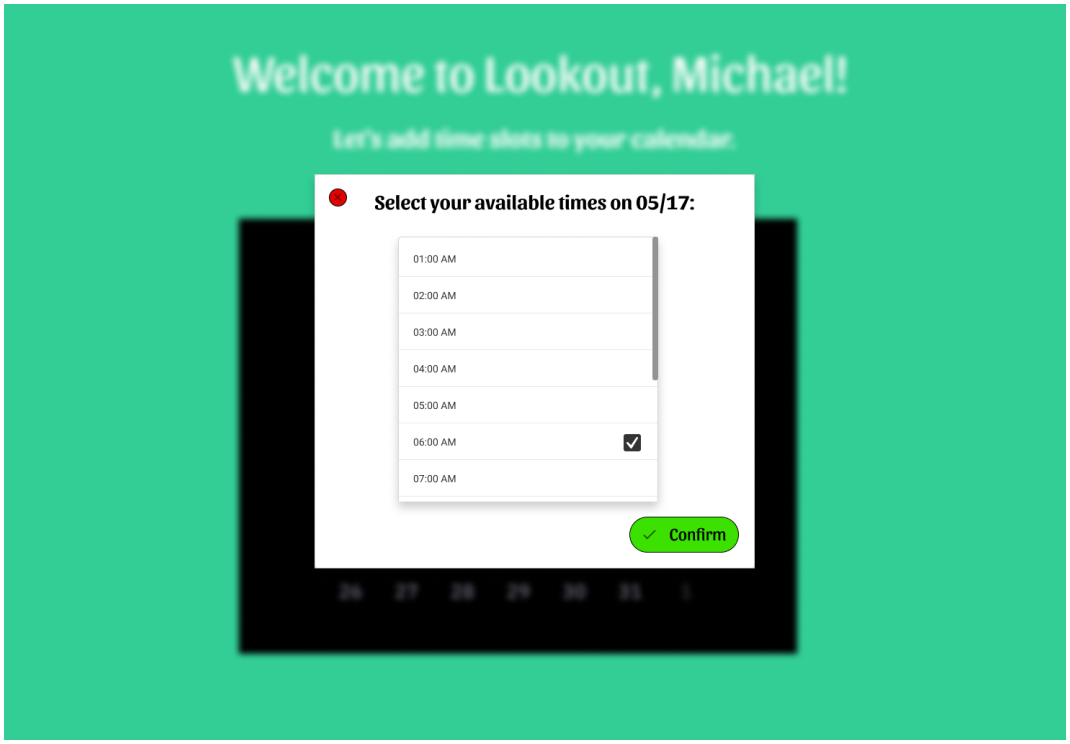


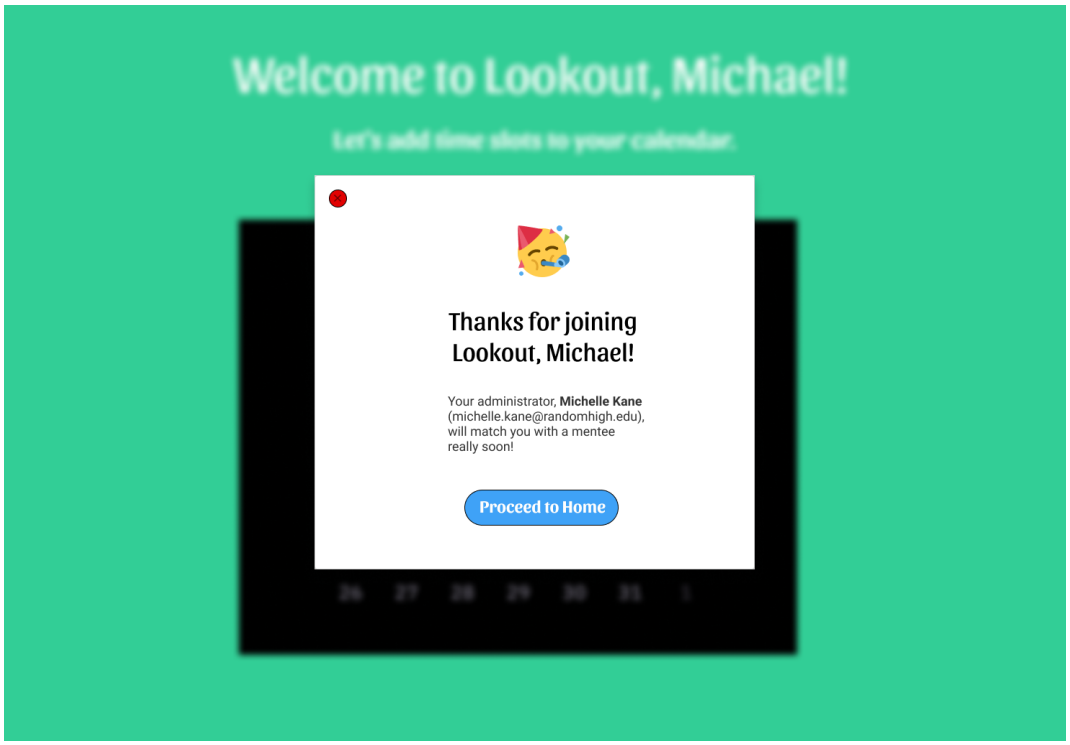
4) Home Page for Mentees After Logging In



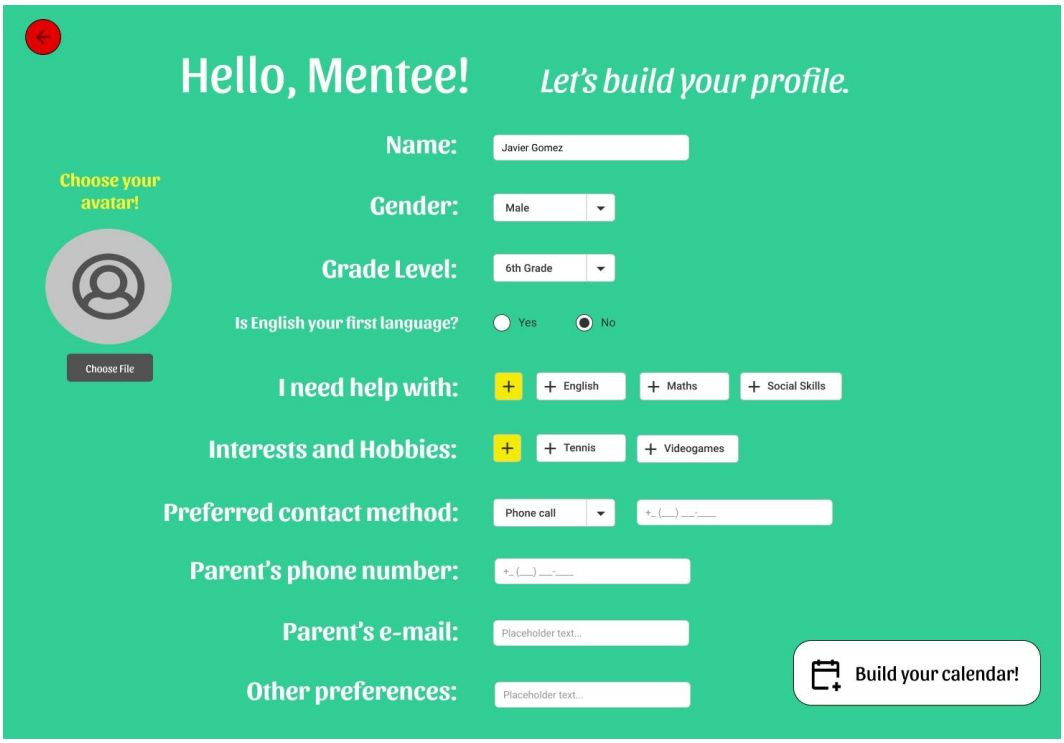
5) Mentor Profile Creation Process

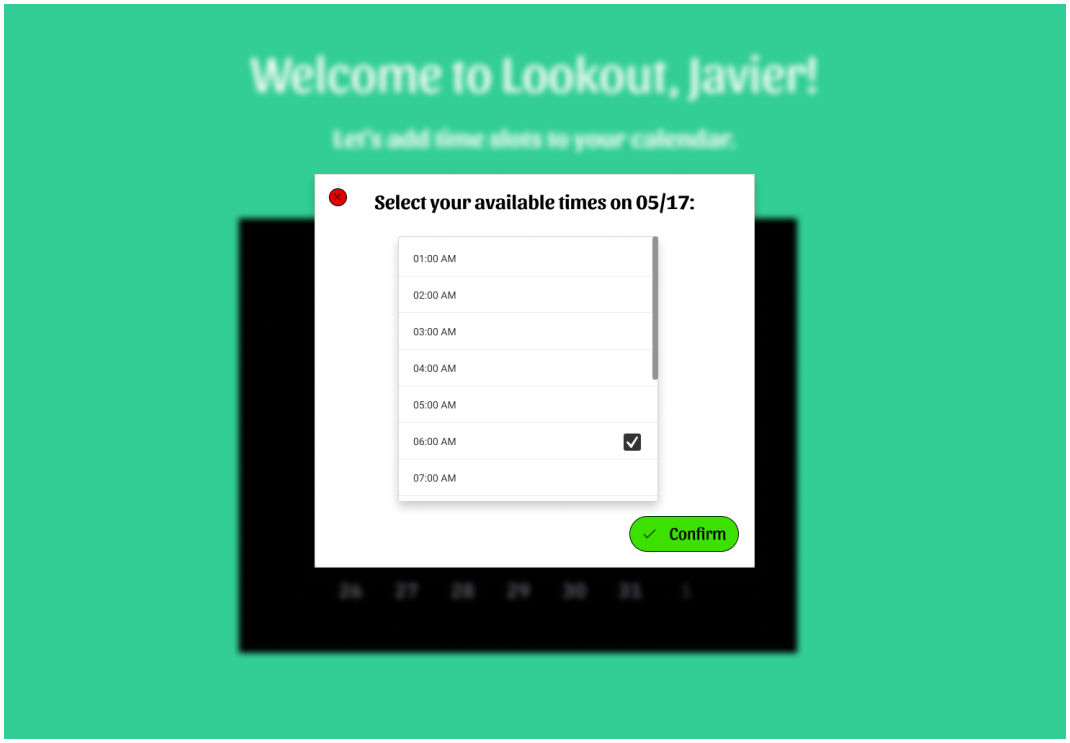


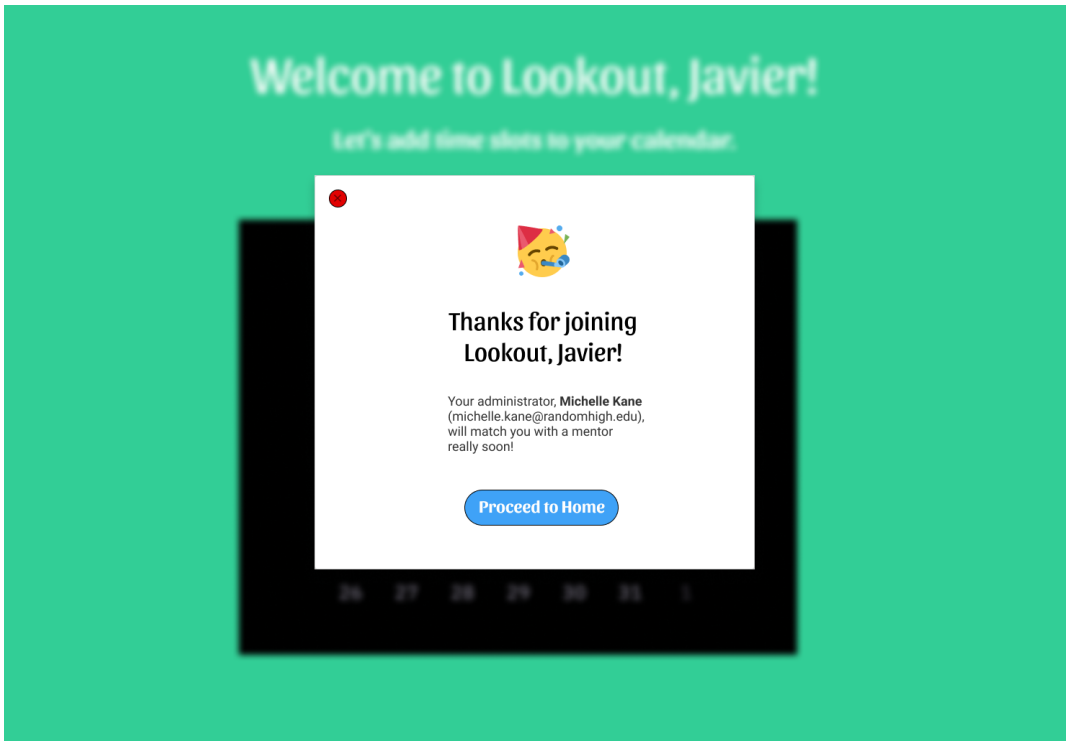

Welcome to Lookout, Michael!
Let's add time slots to your calendar.
Select your available times on 05/17:
01:00 AM
02:00 AM
03:00 AM
04:00 AM
05:00 AM
06:00 AM
07:00 AM
Confirm


Welcome to Lookout, Michael!
Let's add time slots to your calendar.
Thanks for joining Lookout, Michael!
Your administrator, Michelle Kane (michelle.kane@randomhigh.edu), will match you with a mentee really soon!
Proceed to Home

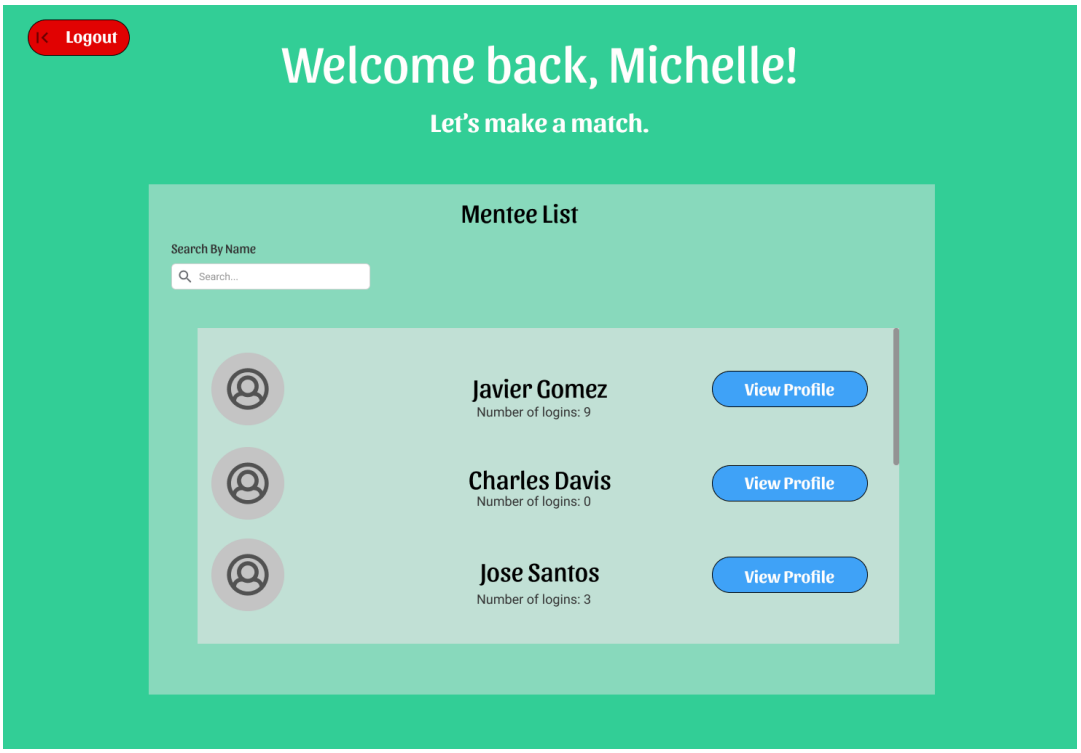
6) Mentee Profile Creation Process

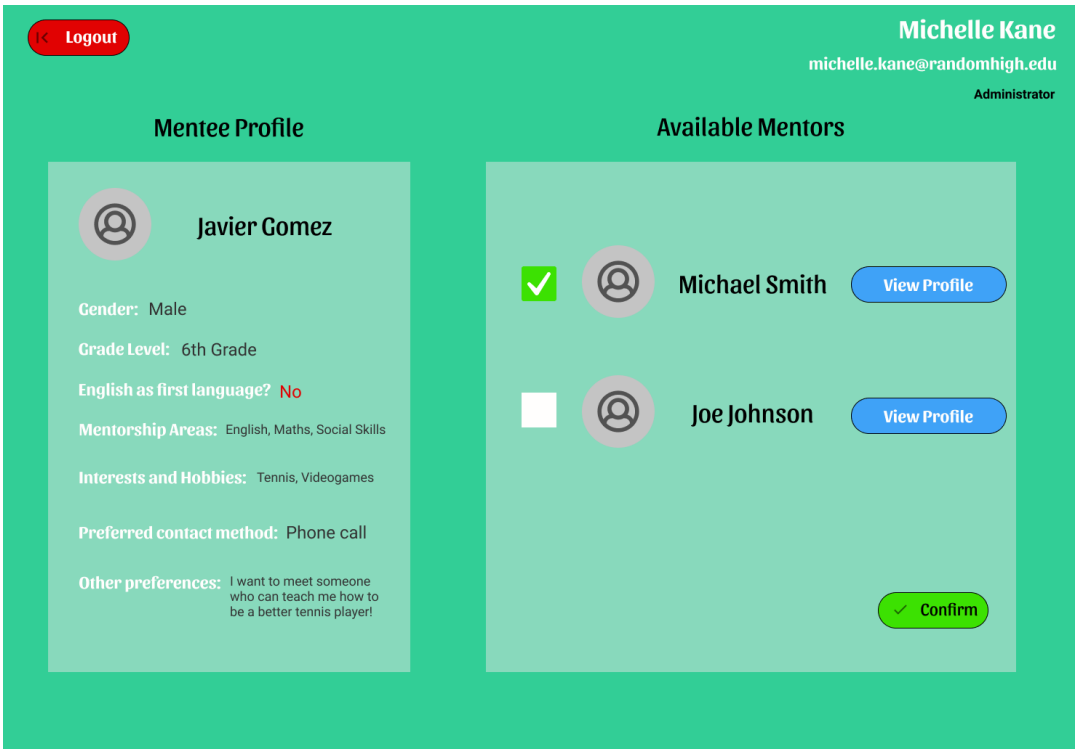


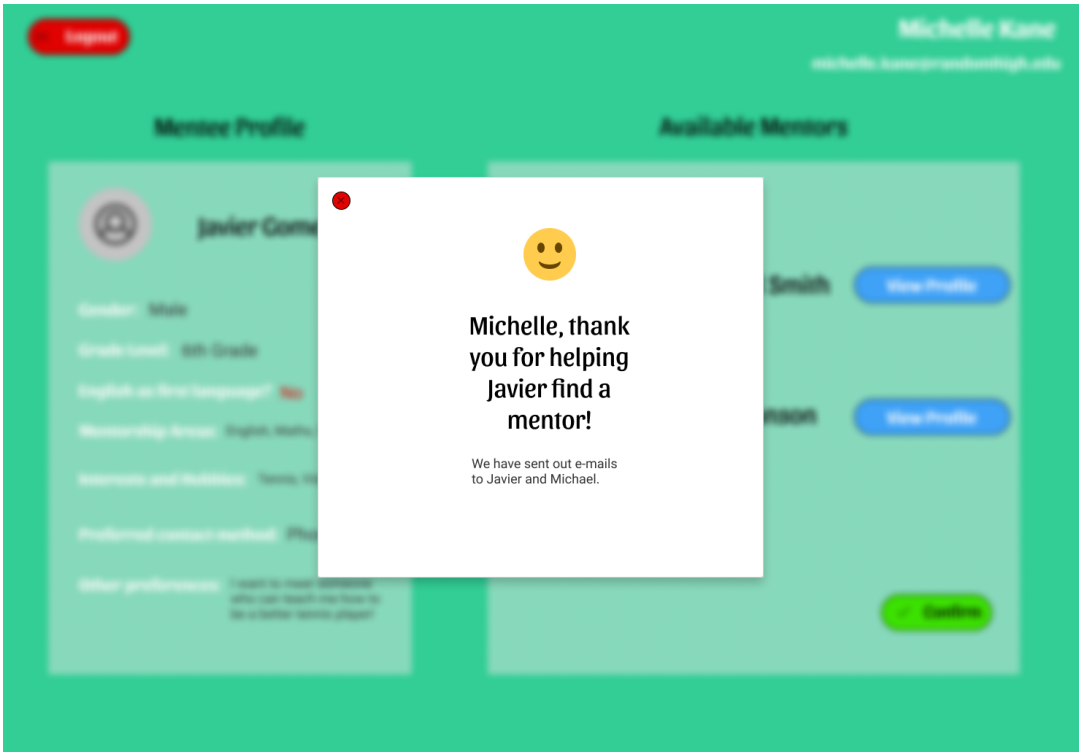

Welcome to Lookout, Javier!
Let's add time slots to your calendar.
Select your available times on 05/17:
01:00 AM
02:00 AM
03:00 AM
04:00 AM
05:00 AM
06:00 AM
07:00 AM
Confirm


Welcome to Lookout, Javier!
Let's add time slots to your calendar.
Thanks for joining Lookout, Javier!
Your administrator, Michelle Kane (michelle.kane@randomhigh.edu), will match you with a mentor really soon!
Proceed to Home

7) Teacher/Administrator Manual Matching Process






Michelle, thank you for helping Javier find a mentor!
We have sent out e-mails to Javier and Michael.

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