CS 194H

Spark - Final Report

Bronson Duran, Nathan Eidelson, Kevin Khieu, Lucas Throckmorton

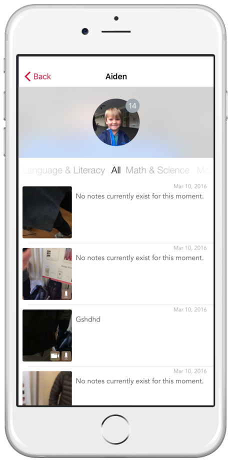
Problem:

Over the past two quarters, the main need our team has focused on solving is the lack of sufficient student growth documentation in early education. Due to the dynamic nature of pre-k/kindergarten learning settings, it can be difficult for teachers to gain a holistic understanding of how each of their kids is developing, as well as define metrics for success. This leads to students falling behind in certain development areas since teachers cannot effectively give help without sufficient data on how a child is performing. This problem is exacerbated in under resourced schools, as the teacher-student ratio is much lower than in more affluent schools.

In addition, we found that in the current system, parents on average meet with teachers only twice a year for ten minutes. Parents generally want to be involved with their children's education, but they lack the time and means to effectively do so. This wasn't the main problem we focused on solving, as it can't be solved without first solving the issue of student data collection. However, our solution does heavily address this need as well.

Solution:

Our value proposition is "Helping Teachers Help Students", and our mission is to help children maximize their potential for growth. We aim to do this by giving teachers more effective way to gather, categorize, and recollect meaningful data about their students' development. This in turn makes identifying problem areas easier, allowing teachers to more effectively help their students grow. Additionally, this data can also be shared with parents to help them stay consistently connected throughout the year in their child's education.



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Tasks:

1. **Capture Moments**

Since much of early learning is through experiential learning , it can difficult for teachers to quantify growth, hence the need for the ability to capture educational moments as realistically as possible. We do this by allowing for either photos or videos to be captured (“Gathering the experience”). We then allow teachers to add either text or a voice recording to this moment (“Gather the teachers thoughts on the experience”). This is the most important and most difficult task of our solution as it requires the interaction be as fast and intuitive as possible in order to not disrupt the normal flow of the classroom when using Spark.

2. **Categorize and Recollect Moments**

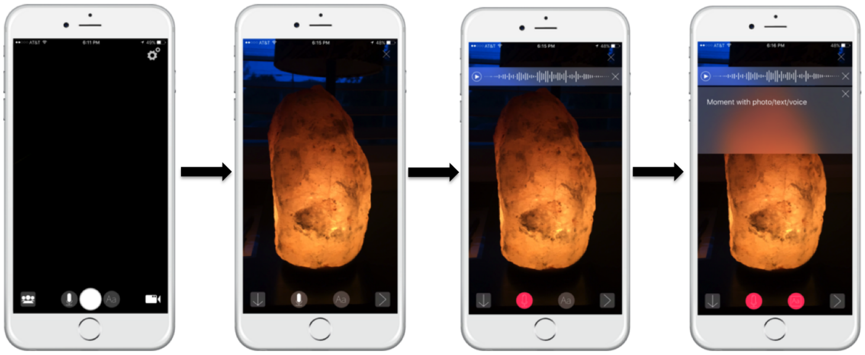
Once moments are captured, in order to make this data useful, moments must be categorized so that teachers can effectively identify which areas of growth students excel in and which areas they need help with. Spark accomplishes this by introducing two moment tagging features - tagging by student, and tagging by developmental category. Teachers can then reference these sorted moments in Spark’s archive. This task is less complex than the first as tagging is a relatively self-explanatory action to pick up, especially since teachers are already used to categorizing student work.

3. **Share Moments**

Once moments are captured and categorized, they can be shared with parents via email. We chose this task as it aims to solve the need of parent involvement. However, much more thought needs to be put into the most effective way of sharing this information with parents (i.e.: via e-mail, texting, or Spark parent app). This task is the least complex of all the tasks we have laid out so far since sharing only involves clicking on a moment and sending it to the child’s parents.

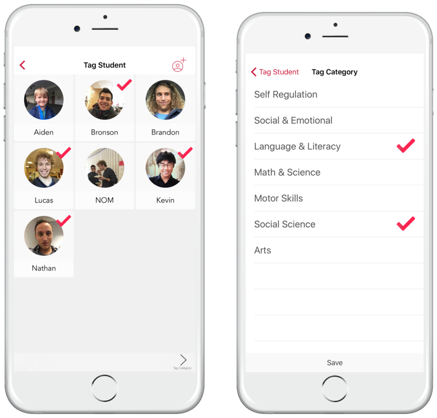
Task Flows:

1. Capture Moments

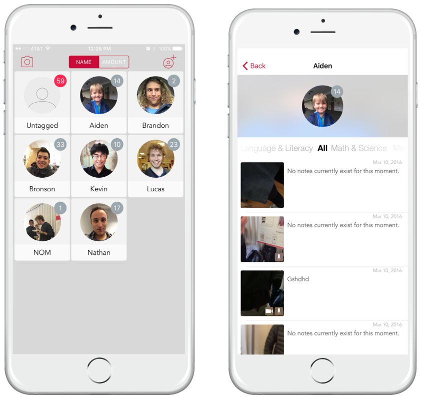


Capture moments with photo/video and add voice/text notes to the moment.

2. Categorize and Recollect Moments



Tag Students and Category after capture screens



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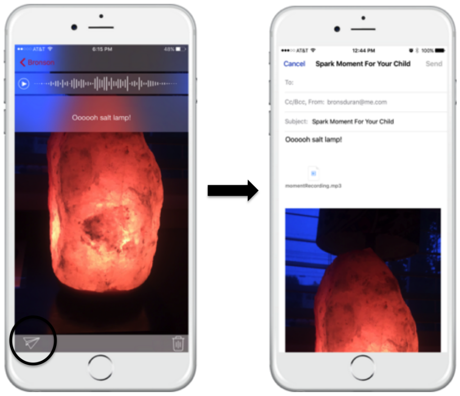
Reference moments in the archive

3. Share Moments



Ooooh salt lamp!

To:

Cc/Bcc, From: bronsduran@me.com

Subject: Spark Moment For Your Child

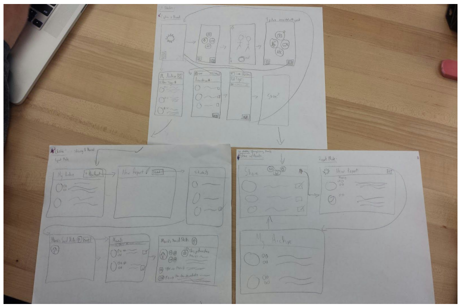
Ooooh salt lamp!

momentRecording.mp3

After selecting a particular moment, you can share that moment via email with the child's parents.

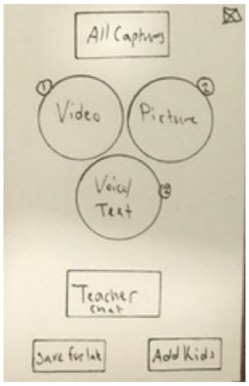
Design Evolution:

Sketches:



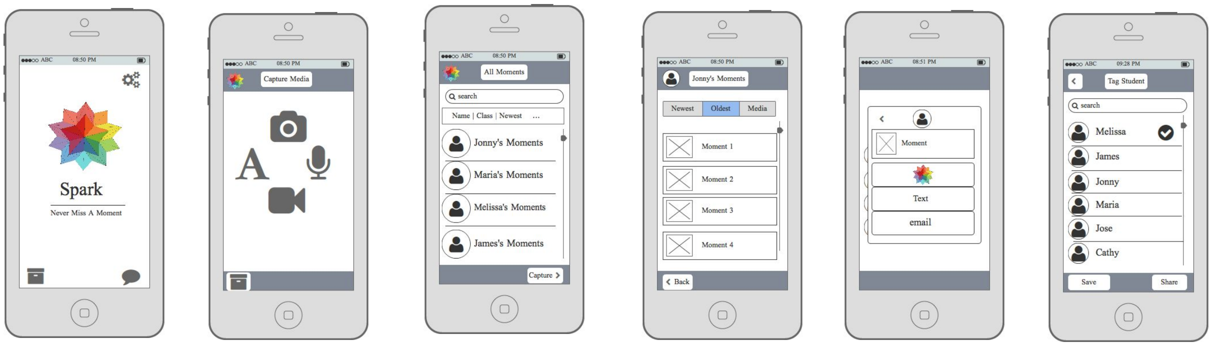
In our initial sketches, we debated between two major ideas for Spark. The first idea was an app that automatically generated student reports by using captured moments to “score” students based on how well they were doing in a certain developmental category. We ultimately trashed this idea because we ran into the issue of figuring out how to “quantify” student development in pre-k/kindergarten education. This led us to our current idea of Spark, which was to grant teachers the capability of capturing and storing moments related to students’ educational development on their phones.

Paper Prototype:



We wanted to make Spark as easy as possible to use for teachers. Since the idea of capturing moments is extremely important to Spark’s fundamental goal, our original home page had the capture flow at the core of its design. Some of the main feedback we received during initial user-testing was that our low-fi paper prototype was too feature heavy and confusing. Users struggled to navigate through the capture flow, and the app felt very clunky as users tried to accomplish the tasks Spark intended to solve.

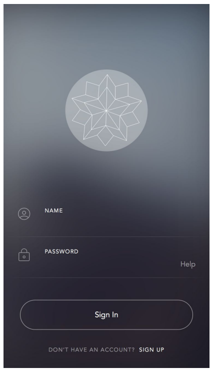
Medium-Fi Prototype:

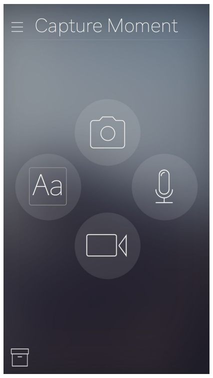


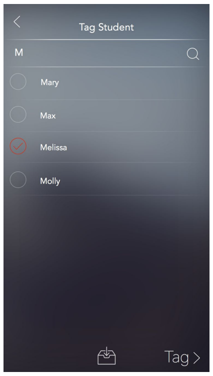
Our medium-fi prototype focused on clarifying the capture flow. We added an extra screen that the user would see just after logging in that would serve as a home page. This provided slightly better understanding as to how the user should proceed through the capture flow; however, the addition of the extra screen made proceeding through the capture flow a lot longer than intended. After listening to and watching teachers' "in-the moment" reactions while they were using the medium fi prototype, many were still confused by this additional home screen (they did not know how to advance to the Capture page and what they were supposed to do on it).

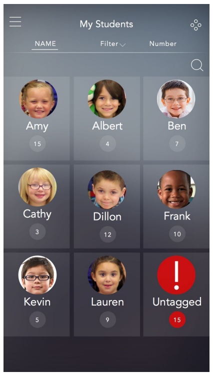
Hi-Fi Prototype #1:

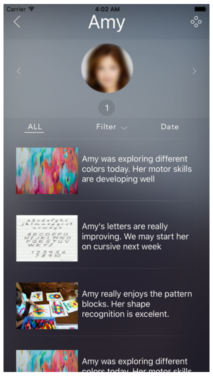
Since Spark's core functionality was to make it as easy as possible to create and share moments, in our hi-fi prototype we decided to remove this first screen and took the user to the capture page immediately after opening the app. For our hi-fi prototype, we kept much of the core functionalities of the medium fi prototype, but added features that teachers during user testing mentioned would be very helpful (i.e.: filtering and untagged moments). The limitations of implementing these features, however, was that we thought it might make our final app too feature heavy and confusing; in order to address this problem, for our high-fi prototype we focused on a really simple, clean design that had clear transitions.









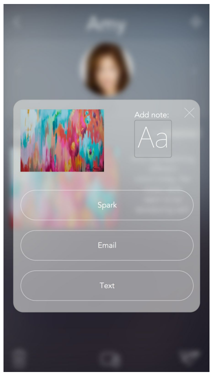


Amy was exploring different colors today. Her motor skills are developing well

Amy's letters are really improving. We may start her on cursive next week

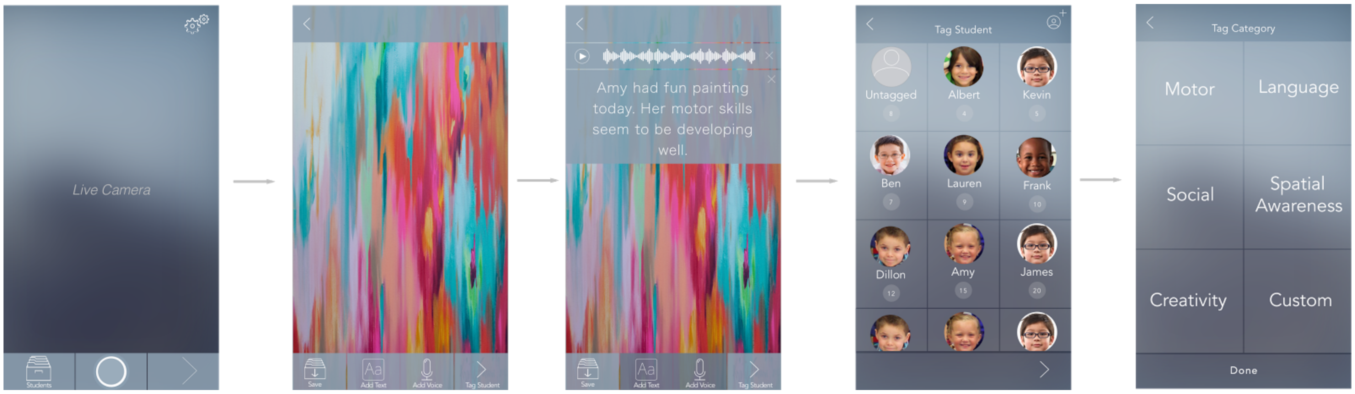
Amy really enjoys the pattern blocks. Her shape recognition is excelent.

Amy was exploring different colors today. Her motor skills



Hi-Fi Prototype #2:

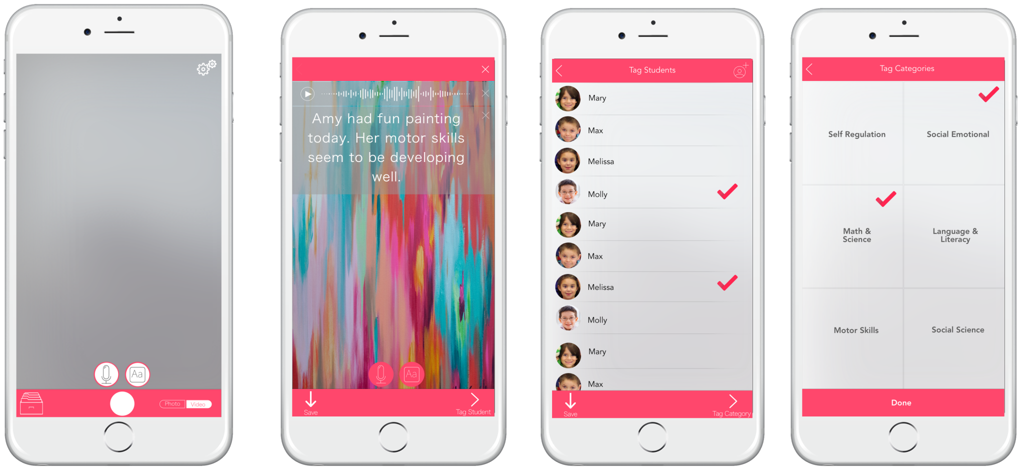
Our second hi-fidelity prototype brought us closer to our final design for Spark. Using inspiration from Snapchat and Instagram, we streamlined the capture flow by having the home screen set to the camera/video view of Spark. From here, the user could either capture a moment with media, skip to take a moment without camera/video, and/or access the archive. The screen was significantly more understandable since it built off of precedents set by pre-existing apps, and the changes were effective in that teachers could capture moments quickly and intuitively without getting confused.



Amy had fun painting today. Her motor skills seem to be developing well.

Hi-Fi Prototype #3:

The final hi-fi prototype for Spark focused primarily on implementing a design overhaul of the app. We changed our color scheme to red + white to add energy to the app's overall look and feel. Additionally, we altered our archive designs to be consistent with iOS paradigms. Functionality wise, we made the decision to remove the skip button that allowed users to capture moments without video/photos and moved this functionality to the photo/video capture screen. Now, users can capture moments with or without media on a single screen.



Amy had fun painting today. Her motor skills seem to be developing well.

Overall:

Looking back, the biggest overall changes we made to the app were towards our capture flow. We constantly iterated over new designs for our capture screen in order to make capturing moments fast and easy for teachers. This quarter, we also made an effort to revamp the app with a complete design makeover, which gave Spark a new attitude/feel. Regarding evaluation techniques that were most helpful to us over the course of development, user testing combined with Lookback.io was the most important technique we used to experiment with Spark. Having real teachers use and evaluate our app was extremely valuable in terms of effectively crafting our app towards their needs. Observing their interactions with Spark helped us make the app better as we progressed through our prototypes (especially with the capture flow), and being able to use Lookback.io to track user clicks/misclicks was nice in that it helped us figure out which features needed more clarity.

Final Interface:

Spark has reached a stage of completion where there are no longer any wizard of oz techniques. While it is not quite prepared for release to the app store, it has a fully operational backend and could be used by teachers. Listed below are all implemented features, as well as descriptions of the user interface that provide access to these features.

Account Creation, Login, and Password Recovery: Users can create a new profile which can be accessed from any device with Spark. For the most part, the interface for these three screens appears and behaves like any other sign in / create account / recover password app screen: the login screen provides the user with the two required input fields, and provides immediate access to the “create account” and “password recovery” screens, so that all users can quickly get started.

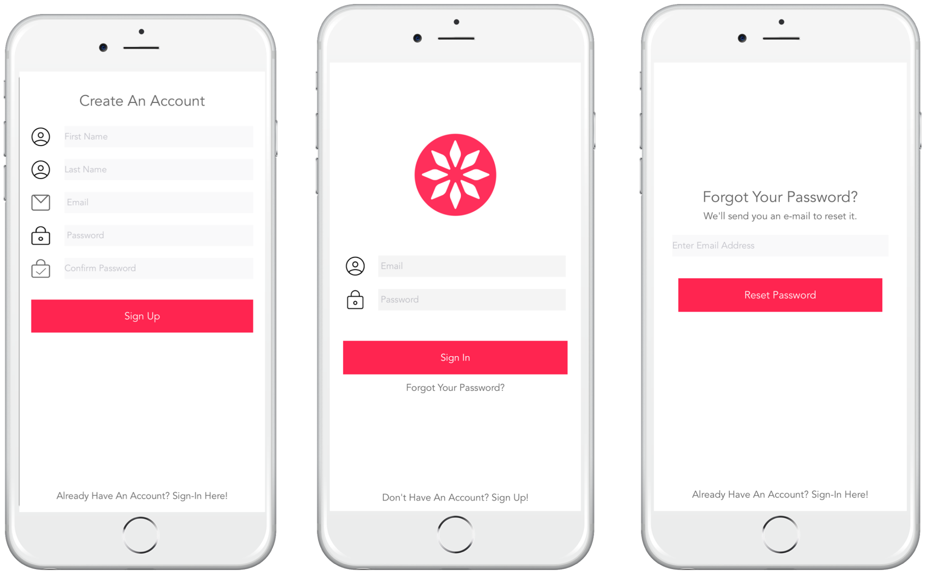
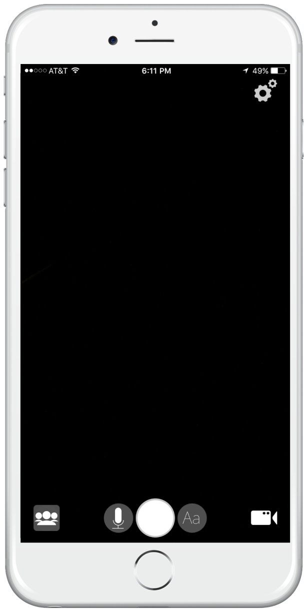
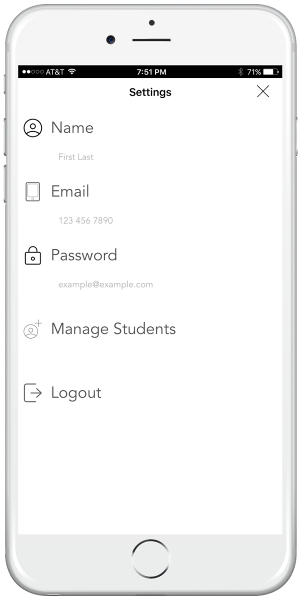


Photo / Video Capture: Immediately after logging in, users are brought to the capture interface. Here, they can navigate to other parts of the app such as the student archive and settings pages, or they can begin to capture and construct a moment. For most use cases, the capture flow will begin with taking a photo or video of the moment. A camera capture button is located in the center of the bottom of the screen, like most camera applications, and a toggle button exists on the bottom right, allowing users to switch between photo and video capture. Simply tapping the capture button in photo mode will take a picture, while taking a video requires two presses: one to start and another to end the recording. To provide the user information regarding the state of the camera, the capture button changes with the state: it is plain in photo mode, has a large red circle in video mode, and a red stop button when actively recording, to make it obvious that the next tap will stop recording.





Settings

Name

First Last

Email

123 456 7890

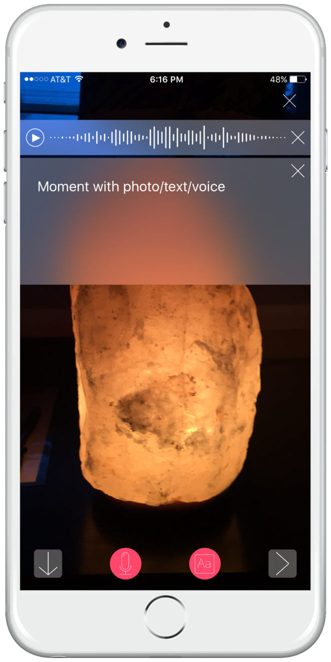
Password

example@example.com

Manage Students

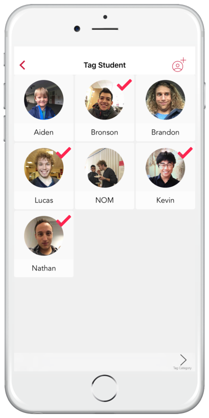
Logout

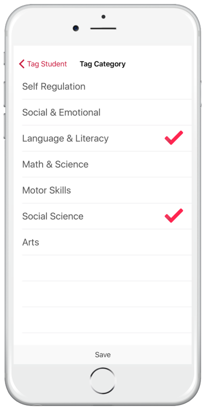
Adding text and voice captions: When creating a moment, users can add text or voice after adding a photo/video, or can skip capturing photo media. In either case, a user just has to toggle on the text or voice media input by tapping the corresponding button (located on the sides of the camera capture button). Doing so will make a corresponding media window appear. Media can be deleted by ‘x’ing out of the window. If a photo or video was captured first, it will be displayed in the background while the user adds text/voice to the moment.



Moment with photo/text/voice

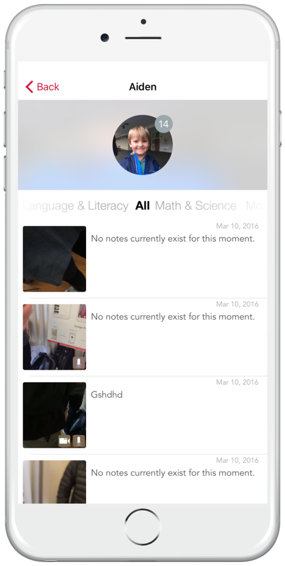
Tagging moments by student and by category: After adding all desired media, users can continue to tagging by selecting the '>' button in the bottom right of the capture screen. Users are then shown all of their students, from which they can tag as many as they would like by selecting them. If they select the '>' button again, they can tag the moment by developmental category, again by selecting any appropriate entry.





Saving moments: There is a large "Save" button at the bottom of the last stage in tagging categories, active only once all tagging has been completed. These moments can later be accessed in students' moments in the archive. Additionally, teachers can shortcut the moment creation process and leave tagging for later. To do this, a second save button can be accessed on the camera/text/voice capture screens, portrayed with a downward arrow. These moments will be listed under "Untagged" moments in the archive.

View moments by student and share/delete: From the camera capture screen, users can access the archive by tapping the archive button in the bottom left hand corner. In the archive, a user can view all students and can sort students using the segmented view buttons at the top (either by name or by number of moments). From here, they can select a student in order to view a list of all of that student's moments. In the newly presented view, they can then filter these moments by developmental category using the picker wheel located under the profile picture. Individual entries in the moments list include the associated photo or video thumbnail, the notes taken with the moment, and icons indicating whether voice or video content also exist. Selecting one of these moments will open up the moment in higher detail: photo or video will be shown at full size, video will loop, voice recordings will be playable. Furthermore, users can send a moment from here by selecting the paper airplane icon in the bottom left. This will auto-populate an email with all of the associated media as attachments, addressed to the parent's email. Lastly, they may delete a moment using the trash button in the bottom right. Currently, however, this trash button is actually a dead button, as we did not manage to write the logic required for removing moments from all associated students appropriately.



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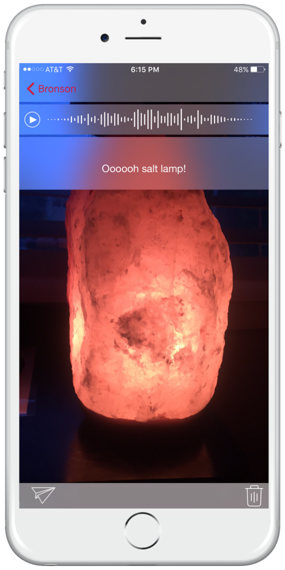
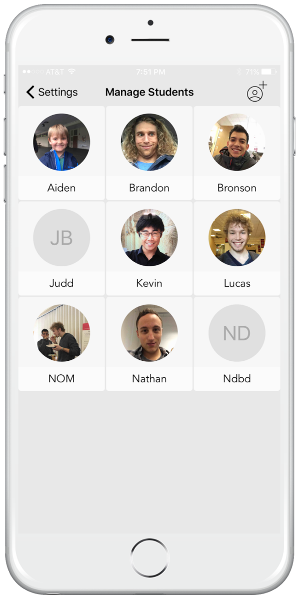
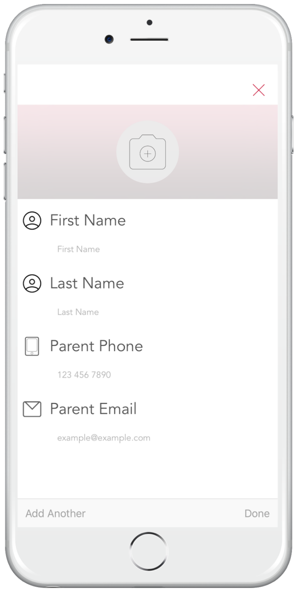


Oooooh salt lamp!

Tag untagged moments: To tag untagged moments, a user must select "Untagged" from the archive. They will then be presented with all untagged moments. Selecting a moment from here will allow them to edit the moment, adding text, voice, and tagging information in the same way as they would when creating a new moment. However, they cannot change the associated video or photo, as these types of media must be captured in real time in the classroom.

Add / Manage students: From any view that lists all students (archive, tag students, manage students), users can add new students to their class by selecting the rightmost button in the navigation bar at the top of the screen. This will prompt the user to enter the student's name as well as the parent's phone and email. Once all information is added, teachers can either save the single student by selecting "Done" in the bottom right, or continue adding students by selecting "Add Another" in the bottom left.





Incomplete: One final piece of functionality that was not completed was the ability to manage user profile settings. If a user accesses the settings menu from the initial capture screen, they will see fields to update profile name and email. Currently, these fields are just placeholders. Though implementation would not be particularly involved, we prioritized all functionality for the actual capture flow and student/moment management, and decided to delay implementation on these account management details until after the class.

Technologies used: The app was done entirely in Swift and programmed in XCode, though we relied on Parse for our backend, and used a third party open source library called LLSimpleCamera to be able to customize our camera with our own buttons on top. The mocks for the application were done using Sketch. XCode is a great development environment and Swift helped get the application off the ground quickly.

Making it Real:

Team

We are a group of four Stanford students with versatile skill sets and a strong passion for education. Our backgrounds comprise a mix of UI/UX design skills and iOS/Web Programming. Along with our own personal experiences growing up in America's education system, we have accumulated a great deal of insight regarding the current state of pre-k/kindergarten education by conducting constant need-finding throughout the last 6 months. Amongst the four of us here, we have considerable past experience working on past apps/internships; we hope to apply what we have learned in the past to make Spark an effective solution to teachers' and parents' needs.

Business Model

Spark will be initially distributed as an iOS application for teachers and schools to download and use in their classrooms. Downloading Spark will be free, but in order to actually use the app, schools and teachers must purchase licenses. These will be made available on our website and can be sold both individually and in bulk. Upon further growth, Spark will also expand to include a desktop version which teachers can sync with their mobile accounts, making Spark more functional and easier to use

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Spark's target market will be educators in the pre-k/kindergarten/lower elementary schooling levels. Licenses for Spark will be sold to both teachers and school administration. According to the latest US Jobs Census Data, there are 1.7 million elementary school teachers in the U.S., so the market for Spark is fairly large.

Pricing for Spark will primarily revolve around the sale of licenses to teachers and school administrations. Licenses can be purchased online on Spark's website, and the goal will be to make these licenses affordable so that cost doesn't serve as a barrier to using Spark. To aid in this mission (especially in our early years), we will seek sponsorship and venture funding until Spark can narrow in on an optimal pricing strategy.

The long term goal of Spark is to change the way parents and teachers approach their children's education. Spark introduces the concept of having a constant dialogue between teachers and parents throughout the course of the entire school year, and it's this constant communication that will allow Spark (and similar technologies) to serve as a valuable tool in improving the education of elementary school children for years to come.

Summary:

The key innovation for Spark is the fact that we pulled ideas from existing media sharing applications such as Instagram and snapchat and applied them in such a way that solves an immediate and real problem. Specifically, before Spark there was no effective way to gather and analyze data about how children are developing in the early education system. We believe that many of the problems in the world stem from people receiving sub-par education. If we can more effectively teach children, starting at a young age, then many other problems will be solved as well.