THRIVE

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Research, Mobile Application Prototype & Promotional Website

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RESEARCH

Research Statement

The goal of Thrive is to create an interactive storybook with personalized avatars that helps children hit developmental milestones. This happens concurrently with enhancing the child-parent reading relationship through digital dialogic reading and the child's use of a self-depicted avatar. By combining the elements of avatar play and dialogic reading, Thrive offers an engaging and educational experience for children to assist in further developing young minds and helping them attain developmental milestones. This application was created through research, user experience studies, and testing, as well as knowledge of graphic design principles and early childhood

education. It is also a resource to connect child and parent in an educationally productive medium.

Introduction: The Problem

In today's world, a child as young as three and a half years old is considered "behind" if he or she does not know how to use a mouse (Sharkins, et al 2016). This statistic is a true testament to how much has changed in the last 30 years. Today, technology and media are everywhere. According to a study presented at the Pediatric Academic Societies, "parents reported that by age one 36% of kids had touched or scrolled a screen, 24% had called someone, 15% used apps and 12% played video games." Our society is consumed with a sizable amount of media, so it's natural that children are exposed to technology at an earlier age. "Today, more than a quarter of adults in the USA have downloaded apps for their children, and products for preschoolers now make up a majority of Education apps for sale in Apple's App Store" (Shuler, et al 2012). Media has a compelling influence on society, culture, and commerce, especially for parents, their children, and how they interact.

When I became a parent, I quickly became obsessed with milestones. A milestone is defined as an action or event marking a significant change in cognitive or physical development (Connolly 2007). As with many parents, my goal was to make sure that my child was on track with the norm. Is my child making eye contact enough? Is her speech on pace with her peers? Does she know her colors, numbers, letters? My main concern shifted from myself to my child immediately. Questions like these were always in the background of my mind. I quickly found that I had little to no knowledge about making sure my child was on track with her developmental achievements.

I set out to find those answers. The available information is vast, plentiful, and sometimes overwhelming. I wanted something that I could customize for my child's specific age range that she would recognize and connect with, even at an early age. Whether that was stories, games, or videos, I wasn't exactly sure, but I could not seem to find *it*. What I did find was a real lack of personalization in these applications, and the interaction with my child was unintelligent as I searched for remedies to my parental anxiety.

There were single applications devoted to teaching a child to tie their shoes, complete websites and applications for parents to understand milestones, and some strongly worded blogs about sleep training. Frankly, the market for telling parents how to parent is saturated with quantity. It lacks real quality in offering effectively designed applications and individualization in child development applications whose users are young children.

Technology, Early Education, and Adult Influence

Questions of how children process digital information have existed since the invention of the television. Researchers believe that "technologies have continually held the promise of improving the learning process" (McEwen 2015). Motivation, creative problem solving, and an overall appreciation (Tucker 2016) and understanding for an unavoidable medium are some of the benefits children get from engaging with technology. Technology isn't going anywhere.

Parents and other caregivers play a crucial role in how children comprehend digital information and whether or not the child's interaction with technology is positive. As children are sometimes left to consume content on their own, parents are missing out on a remarkable opportunity to facilitate a superior educational bonding experience with their child. Instead of children mindlessly absorbing media, they need to interact with it, engage with it, and be challenged by it.

The documentary "The Beginning of Life," about early childhood development, explains how a strong relationship between parent and child is unquestionably the most significant connection in life, which ultimately produces a healthy and more successful child (Renner 2016). The more a parent is engaged with a child during media time and in general, the more that child is likely to be a productive adult (Brannon, et al 2012). Writing for CBS News in 2015, Michael Casey describes educational apps as "digital candy" and warns parents to make informed decisions about what applications to expose their children to. He also suggests that parents should "avoid apps that don't involve the most powerful learning resource we have -- other humans. Instead, look for apps that encourage social interaction via discussion, competition, or conversation" (Casey 2015). This is a stellar suggestion to warn parents about the abundance of inadequately designed apps. But why do children's apps today do such a poor job of encouraging the parent-child relationship and effective learning through digital media?

The short answer is the lack of a successful marriage between interaction design and early childhood development. Most applications available today are not designed using the psychological and educational principles needed to create a solid heuristic learning experience. Making those developmentally appropriate choices is not only difficult but becomes even more complicated when trying to delightfully engage a child. That next level of engagement, in which children are learning while having fun, is necessary for keeping children interested and challenged.

I had always been told that kids are rotting their brains by spending time with technology and media. Children will develop more in the first three years than they will collectively their whole life (Renner 2016), so it is essential to constantly challenge a young mind. Lack of interaction and engagement when using technology can cause an overall negative "couch potato" experience. Unsupervised screen time is seen to negatively affect later academic performance and social interaction (Sharkins, et al 2016). However, the value of technology and media for young children far outweighs the potential risks. In a study conducted by Douglas Clements, technology showed that it "serve(s) as catalysts for social interaction, with children spending nine times as much time talking with peers while working at computers than while doing puzzles" (Clements 1998).

The Benefits of Dialogic Reading

Grove J. Whitehurst, an experimental child psychologist, coined the term 'dialogic reading' as the practice of adults engaging children while reading through questioning. This engagement challenges children by expanding their responses; repeating characters, actions, and objects; and rewording portions of the story children strengthen their literacy skills (Zevenbergen, et al 2003). For example, effective dialogic reading involves asking open ended questions like, what do you see on this page? Or, tell me what's going on here? The parent then follows up by praising any response and helping as needed. The more the parent expands on those responses and makes the experience enjoyable, the

more effective the child will be. Even more influentially, this method of reading reinforces the parent-child bond and basic language skills.

In research about technology for children, the term dialogic reading often arises. This concept is a form of shared reading between child and parent that assists with the child's comprehension and attitude towards reading through questioning (Brannon, et al 2012). This questioning helps develop the child's vocabulary, which is directly correlated with success in reading. Diana Brannon and Linda Dauksas, both professors from Elmburst College, observed parents and children participating in dialogic reading and those who did not. It was shown that the "dialogic reading group were responsible for 13% more of the conversation when speaking with their family member during shared reading" (Brannon, et al 13). Children who participate in dialogic reading with their children had longer conversations and have stronger vocabulary skills.

Reading will always be a critical milestone in early education. It is important to make that experience both fun and educational, and because of that the early childhood education market is extremely large. According to Time magazine there are over 80,000 education apps available for download in Apple's App Store and 72% are focused towards toddlers and preschoolers, but many of these applications lack the fundamental components needed to successfully merge technology and early childhood development.

Avatars, Storytelling, and Learning

Parasocial Relationships

The definitions of an avatar not only include a digital character in a virtual world, but also a religious concept in Hinduism. Its literal definition from the New Oxford dictionary is "a manifestation of a deity or released soul in bodily form on Earth; an incarnate divine teacher." This definition could be a compelling metaphor for the use of avatars today in technology, as the digital avatars we create are the incarnations of ourselves.

A quick Wikipedia search confirms that the first uses of the word avatar in terms of technology can date back to the early 1980s, when sci-fi gaming started to become popular and quickly spread throughout many facets of our society. Today avatars can be seen in Internet forums, chat rooms, video games, education, and social media. But how and why do we connect with them?

The term parasocial means essentially one-sided relationships. Ask any psychologist, and they'll explain this phenomenon with an example of a celebrity. James Sanderson of Arizona State University dissected the breakup and reunion of the 90s popular boy band, New Kids on the Block. He used blog posts of their "comeback" as an example of how parasocial relationships work. In 2008 each band member posted their thoughts about returning to the stage on the band's website. The site was flooded with over 2,178 postings from fans sharing feelings, thoughts, and experiences on how the band had affected those people's lives, although those band members had never met or knew a single person who commented. Parasocial relationships occur when one side puts in all the work and effort and the other does not even know they exist (Sanderson, 2009). Contemporary media and technology have a tendency to reinforce these types of relationships.

Avatars are a form of parasocial relationship. The user puts in puts in all the effort, and the avatar is unaware of their existence. Parasocial interaction is described as the "relationship between media users and the media figures or characters" (Jin and Park 2009). Feelings of affection, gratitude, and loyalty are expressed through these bonds, forming an identity (Sanderson 2009). At a young age, children are able to see and feel a benefit in a parasocial interaction. They respond to them as they would any conventional relationship. Jaye L. Derrick and Shira Gabriel of the University at Buffalo, State University of New York illustrate that parasocial relationships have a tremendous effect on self-esteem, as they have a low "risk of rejection, offer low self-esteem people an opportunity to reduce their self-discrepancies and feel closer to their ideal selves" (Derrick 2008). Just as real environments like homes, schools, and playgrounds promote socialization, virtual worlds do as well. The way we use avatars in a digital context is very similar to how we would conduct ourselves in a real-life social setting (Beals 2010).

Personalization

According to the Glossary of Education Reform, "Learning improves when students are inquisitive, interested, or inspired, and that learning tends to suffer when students are bored, dispassionate, disaffected, or otherwise disengaged" (Abbott 2014).

Carly Shuler and Cythia Chiong, of the non-profit Cooney Center which specializes in children's literacy skills, point out that "personalization has great potential as a way to engage children and help them develop digital participation skills that learning scientists contend are valuable in the long term" (Shuler, et al 2010). When a user can relate to the content on a personal level, the more engaged they will become with that content. This can be done through use of their name for a character, depictions of familiar toys and objects, or an avatar, and nothing is more personalized that an avatar that looks like you.

Avatar Play as a Benefit

An avatar is defined as an "embodied character that represents an actual person in a digital world. They can realistically resemble the personality of the person controlling them which facilities self-reflection on the manipulator and the perception of other avatars in their presence" (Lui, et al 40). These characters can look any way the creator intends. However, I will refer to a "self avatar" as an electronic character that represents the user and has a digital likeness that closely resembles how the user looks. This is different from a traditional avatar that can look like anyone or anything.

The use of avatars is seen sparingly in children's apps but could be a significant learning tool for children as young as two. Avatars have a unique way of promoting a personal experience and

connection with digital content. Research shows that individuals are more motivated and determined to complete a challenge if they create an avatar that resembles themselves (Kil-Soo, et al 2011). This is because the user makes a personal and emotional reference to the avatar and wants the avatar to succeed just as they would want themselves to in real life. This idea supports that just as parent-child engagement strengthens the learning process, the child and avatar relationship does as well.

Extensive research has been done exploring the relationship and benefits of children using avatars, both to teach them a task and to build a relationship. With features like bitmojis and personalized avatar software becoming increasingly popular with a younger audience, it makes sense to use a child's self-likeness in technology made for children. Our world is so dependent and supportive of technology, there should be no deficiency of effective design for children.

Storytelling

Research has shown that the traditional teaching avatar enhances literacy development and storytelling behaviors (Lui, et al 2017). A "teaching" avatar is a character that is portrayed as an instructor in a digital environment. Much like a real teacher, they answer questions and help guide the child though an experience. Virtual worlds and a digital presence have become more prevalent in children's lives, and therefore, fostering literacy within these discourses is essential. The rationale behind Thrive is that the self-teaching avatar will enhance that development even further.

As technology and media play a bigger role in our lives, parents, caregivers, and teachers have a responsibility to make sure that presence is effective and positive. Finding a successful means to teach, engage, and bond with our children through media is the ultimate goal of any parent. Thrive supports that behavior. Not only will children gain a better understanding of the task they are trying to accomplish, but they will also gain media and technology literacy while bonding with their parents.

Though the market is plentiful, with over 80,000 educational applications (Time 2015), the roles of avatars are mainly seen as "teachers" as previously defined. This application would focus on avatars in the way they are seen in gaming, often called a "CAP" (create a player) or "self avatars" and merging that with the traditional teaching avatar element. This method allows the user to create their own avatar and use it in a chosen digital environment but also be guided in a direction of success.

Avatars and Engagement

Considerable research supports the idea that an avatar that closely resembles the user increases the motivation and incentives for whatever challenge is presented. There seems to be a more positive attitude of affection, connection, and passion when the avatar you create appears like yourself. The greater the cognitive connection between user and avatar, the more likely the user is to actually want to use the avatar.

Other research has been done exploring identity and avatars. Laura Beals, a member of the Development Technologies Research Lab at the Eliot-Pearson Department of Child Development at Tufts University, takes that research one step further. She studies how adolescents are able to more freely explore their identity through avatar use. As many adults know, wandering through pubescence is uncomfortable and complicated, especially when dealing with identity issues. Avatars and digital worlds can give children a safe space to explore who they are. This use of avatars can

aid in the child's creativity and comfort level in their exploration of self. Perhaps a child is looking to explore a different hairstyle; a digital environment gives them the opportunity to do that more freely without consequences. Choices made by the users about the decor of their virtual rooms or the music choice for their virtual speakers provide insight to their real lives and develops their identities (Beals 2010).

In the 1992 novel, *Snow Crash*, which popularized the term "avatar" in a digital context, Neal Stephenson describes the benefits of digital avatars: "your avatar can look any way you want it to, up to the limitations of your equipment. If you're ugly, you can make your avatar beautiful. If you've just gotten out of bed, your avatar can still be wearing beautiful clothes and professionally applied makeup" (Stephenson 1992). This describes how the freedom to explore identity is beneficial and enjoyable for people of all ages. Avatars are similar to having an extension of self that has significantly more freedom.

This type of engaged digital play at an early age could have a huge effect on supporting cognitive development as well as the natural evolution of gender roles, general interests, morals, and values. It also gives the parent a deeper and more honest look at their child's identity and character, which could possibly give parents an opportunity to provide help or support where they did not know it was needed without digital play.

Digital play and avatars keep children engaged (Sharkins 2016, Beals 2010, Lui 2012), which has a positive effect on learning and comprehension. The idea that children can effectively learn from an avatar may have something do to with the visual literacy. While some avatars look more like cartoons, all successful ones have human-like gestures. Children learn from a young age to pay attention to gesture for relevant information (Hyde 2014). Susan Cook, a psychology professor from the University of Iowa, observed children solving math problems with help from a gesturing avatar and non-gesturing avatar. The avatar assisted with answering sampling questions and giving directions. Children exposed to the gesturing avatar were more successful overall and learned more quickly, because gestures can encourage learning (Cook 2016).

Learning in a Digital Time

Kimberly Sharkins, an Education Coordinator at University of Alabama, looks at the exposure of media, technology, and screen time for children in the 3-5 year old range and explains that use of technology increases interest for younger children. While it is discouraged for children under 3 to have screen time, it is appropriate if the use is hands-on and empowering as a learning tool. This study highlights the importance of the role of the parent and how they are engaging their child while reading or using technology.

The important thing about "screen time" is not directly related to the time they spend online. Rather, when considering such experiences, more attention should be paid to what children do online, the content they encounter, and their life environment, and support networks in general (Winther 2020). The question of how children digest digital information has been around since the invention of radios and televisions, and "technologies have continually held the promise of improving the learning process" (McEwen 2015).

Screen vs. Print

Rhonda McEwen, a professor of New Media and Communication at the University of Toronto, assessed children through eye-tracking technology using tablets to see if they could complete tasks challenging memory and attention. Based on fixation count and duration, it was found that tablet computers were successful at directing user attention to relevant content.

But what about in comparison to traditional books? Would the change from traditional to e-book affect the child-parent relationship when reading? Nicola Yuill, a researcher from the University of Sussux, observed the mother-child relationship while reading with traditional books and e-books to see how they affected interaction and the child's ability to recall the story. Overall, children were able to recall the story the same from screen to print, but there seemed to be a lower engagement and bond between mother and child during the e-book reading (Yuill, et al 2016). This may have much to do with the parent's preconceived notion about technology.

It is worth noting that this study was done with both traditional and e-books that did not include pictures; thus, the age range covered children who were preparing to be independent readers. However, the comprehensive takeaway is that, regardless of medium, the parent-child interaction is a critical factor. Whether the use of avatars is present or not, the parent's role in support for the child while reading and learning is paramount.

The COVID Effect

Since March 2020, the world as we have known it has completely changed. Social interactions have almost completely moved to different forms of technology. This goes for children and adults. According to *Cyberpsychology Behavior*, parents reported that both they and their children had increased technology and social media use since the beginning of social distancing. Even prior to COVID-19, the use of media for humans continued to play a larger role, but it seems to be on the fast track in 2020. In an article for UNICEF, Daniel Kardefelt Winther reports on how digital game distributors such as Steam report a considerable increase in the number of daily users, from 19 million in early March to a record high of 23.5 million in early April. Especially popular are social simulation games like the Animal Crossing series or Minecraft, which allow players to build their own worlds alone or together with friends.

This behavior shows that people need strong technology literacy, especially now. Steven Tucker, a professor at Virginia Commonwealth University, discusses Lev Vygotsky's Zone of Proximal Development, which is the "distance" between how children understand to use an application and how the application needs the child to authenticate that they understand the content. In Tucker's research, he observes children learning math with the assistance of an avatar, and found the distance that Vygotsky refers to directly affects the success of the ability to comprehend. Two children in Tucker's case study who had similar mathematical and technological "distances" were able to reveal how well they actually understood the content through avatar use.

Another Vgotsky's term is known as "scaffolding" which refers to a process in which teachers' model or demonstrate how to solve a problem, and then step back offering support as needed. The theory is that when students are given the support they need while learning something new, they stand

a better chance of using that knowledge independently. This practice with children is exactly how children should be learning, playing and engaging with media or educational screen time.

Prior knowledge about technology before using an educational tool like this can help bridge the gap. Children who have less digital experience have a larger hurdle to jump over, and it seems this hurdle may get even taller with the increase of technology post COVID-19. This distance is something all application developers and educators must consider when creating an application in this capacity.

The Solution

James Gee, a professor from Arizona State University and discourse analyst, describes primary and secondary discourse. As humans, our primary discourse is the knowledge and information we have obtained through acquisition from our parents, families, and loved ones. Secondary discourse is acquired through learning, possibly at school or work and is an extension of our primary discourse. Literacy is mastered through acquisition in "natural, meaningful and functional settings" (Gee 1998). In other words, children learn better at home through experience and primary discourse rather than being "taught" as they would in a traditional school setting.

Gee highlights the importance of dialogic reading and the parent-child relationship while learning by explaining that learning and acquiring, or practicing, go together. The goal of Thrive is to bring new light to the storytelling process. Instead of using an avatar as a "teacher" tool, I'd like to introduce the use of a "self avatar," where the user becomes the actual teacher. This way a child can watch him/herself in a story, successfully completing a milestone, which could conceivably help them understand better how to complete it in real life.

Thrive is used as a tool for teaching and support. It is not meant to replace the actual trial and error of completing real actions. Since many milestones are only achieved through repeated physical actions and practice, this tool will aid in the cognitive development to reach those milestones. To achieve this, I have applied research about avatar usage and related topics. I have conducted an analysis of existing children's milestone applications, my audience's technology usage, and user testing to make Thrive as effective as possible.

The Target Demographic

To ensure a successful user experience, the age, educational level, and device usage or knowledge must be considered and well thought out. Even before a child enters a traditional school environment, they are learning at a rapid and astonishing rate. Thrive's primary audience is intended to be children in the pre-operational age of two years of age to seven years of age; however, it also includes a secondary audience of parents, caregivers, and teachers.

Children
Thrive is focused on young children between the gaes of two and seven. In terms of cognitive ability, children in this range are considered in the pre-operational stage. According to Piaget's theory of

cognitive development, this is the range where memory and imagination are focal points. Symbolic play, where children pretend to be characters, is also the strongest in this stage (Gelman 2014). This application and research is ideal for this age group.

Parents, Caregivers and Teachers

To reach these children, parents, caregivers, and teachers are essential to my primary audience. They will be the ones helping the child navigate the work and make it accessible in the first place. I hope to reach parents or teachers that have an open mind about technology and embrace the presence of tablets and e-books at home and in school. Since this project has interaction at its core, reaching parents who are looking to more deeply connect and communicate with their child is essential.

In Debra Gelman's book, *Designing for Kids*, she explains the "PTR" or the "Parental Threshold for the Revolting" as the scale for which designers are alienating parents in creating media for children. In order for media to engage with a child at this age range, that media needs to also engage the adult. This concept has been kept in the forefront of my mind when considering both children and parents.

Designers and Researchers

A third, much smaller demographic is also the audience of designers who work in the educational design realm. So much of the content made for children today is poorly made, and I believe the main goal of actually engaging children gets lost in creating something pretty. Designers who have an interest in interaction design and/or avatars would find this research helpful. To date, there is little experimentation on the effects of "self avatar" use on children. Thrive can be valuable for the academic and interaction design community. Designers and developers who are creating child content and media could collaborate very nicely with this type of application and could benefit from uses of avatars in their work.

DISCOVERY

Project Overview

Thrive explores how a "self avatar" benefits children in the pre-operational age of two to seven. Specifically, Thrive examines how a "self avatar" affects the dialogic reading process. This research helps children successfully complete developmental milestones. Instead of a traditional milestone app, where the provider may suggest things to do with your child as they are developing, Thrive creates an engaging storybook environment where children can see themselves as a "self avatar" experimenting to complete the milestone and eventually achieving it. The finished prototype provides an environment for a user's "self avatar" to explore milestones and dialogic reading opportunities.

The Thrive content introduces an avatar build, milestone stories, and personalized gaming. It also includes a reward system for users as they complete tasks (milestones) to further engage and create buy-in. The application prototype was built in *proto.io* and simulates the intended experience and functionality.

The supporting website is a space for parents to learn more about Thrive. It includes descriptions of its functionality, benefits, and user testimonials. The website was built with the content management system *WordPress* with the theme *Avada*. It is sales-focused and intended for parents to learn more about the application, answer parents questions, and hopefully download the application. It also includes an area for visitors to donate, to assist with better developing the app as Thrive continues to grow, and as a login for parents.

SWOT Analysis

In order to evaluate the final aspects of Thrive, I put together a list of its stengths, weaknesses, opportunites and threats in order to better understand the journey of the project.

Strengths

· Mixes dialogic reading and avatars to achieve milestone development through self-guided narrative
· Includes both adult and child
· Grows with child
· Mobile devices are accessible to the target demographic
· Increases technology literacy in children
· Significant value increase since COVID-19

Weaknesses

· Limited budget
· Difficult for one person to develop a lot of avatar options and plot lines

Opportunities

· Lack of personalization in current market
· Content can range and possibilities are endless
· Future growth available as early childhood education is more depended on technology post-COVID-19
· Potential for Thrive to sell to a for-profit educational company

Threats

· Many parents/people believe that iPads are bad for children
· Changes in the way we interact with phones/tablets could affect user experience

Content Research

In order to properly understand my audience and make decisions about technology usage, design choices, parental involvement/motivation, and milestone selection I sent out a survey using Google Forms. The goal of this survey was to assist in properly defining my audience (both child and parent users), the technology available to those users and their comfortability level as well as the general interest in avatars and milestones. The survey was deployed in March of 2018 through personal emails and totalled 109 participants.

Survey Results

Users and Technology Knowledge

While the remaining participants were teachers or caregivers. A total of 91% said that their child did have access to a tablet or phone with apps and only 9% said that they do not have access to a tablet or do not allow their child to have one. Explanations of not having a tablet or screen time mostly included wanting to protect them from "negative screen time" for as long as possible. The survey revealed that on average children have 10 apps accessible to them on their screens and that they spend over an hour per day on said screen. It is worth noting that this survey was done pre-COVID-19, and screen time most likely has increased since then (Clements 1998).

When surveying content of applications for children, I asked what the most important motivator is when downloading an app for your child and nearly 70% of participants said that having an 'educational' quality was the most important, with 'fun' being the second most important aspect of a mobile application. However, two thirds of participants either did no research on the application before downloading or just depended on search terms in the app store to make a decision on an application to choose for their child.

Avatar Development & E-books

In terms of use of familiarity with an avatar, 86% of participants said that they do not have apps for their children that include an avatar, but 85% thought that their child would enjoy creating themselves as an avatar within an app. Sixty-five percent of participants also said that they believe that tablet usage helps their child understand content better.

The survey also revealed that 87% of parents do not use e-books to read to their children, either because they prefer traditional books or they had never thought of using an e-book for reading to their child. Many participants even included that they viewed the phone or tablet as a space for gaming only.

With the results of this survey, it was clear to me that my research thus far was turning into a viable project that was needed in the market. Children and parents were spending more time on a device and were looking for something educational, and the market was lacking in the use of avatars.

For complete survey results, see appendix A

Audience

Thrive targets users that are parents with children below the age of seven and are looking for a scholastic and engaging environment to work on developmental milestones. The majority of these users would be families that are open to instructive screen time and use tablets or technology in their home on a regular basis.

Accessibility
According to the National Center for Educational Statistics, 94% of 3- to 18-year-olds in the United States in 2019 had access to the internet. Half of the world's population used the internet; among the 15–24 age group, the proportion rose to about two thirds. And globally, it seems like most children either have access to the internet or a mobile device for educational or personal purposes (Stalker 2019). The UNICEF reports also show that children who participate in more online activities tend to have better digital skills compared to those who engage in fewer activities.

User Learning Types
Thrive incorporates practices that accommodate all learning types. From an early age, even children will fit into one of the learning types, defined by Walter Burke Barbe. These learning types include, visual, auditory, and kinesthetic, although Thrive focuses on all three of these types of learners and uses a combination of them to appeal to each different learning type.

Visual
These learners learn with their eyes. They prefer learning visual representations like illustrations, pictures, and displays.
Auditory
These users prefer to learn by listening. They are more inclined to favor audio and discussion to better understand a topic. They thrive with repetition, summaries, and storytelling.
Kinesthetic
Users of this nature enjoy learning with a more hands-on approach, they depend on an interactive learning environment that use their bodies. They prefer manipulating objects and touch in order to gain understanding of a topic.

Personas

In order to execute accurate testing and give a realistic representation of my audience, personas were developed for Thrive. A backstory, interests, and goals are applied to each child and parent to create a believable target user. However, from my survey results, it is assumed that users of Thrive would most likely be found doing the following:

· Accessing the internet on a regular basis
· Has a desire to continually develop educationally (themselves or their child)
· Open mind about new, interactive way to learn on a mobile device or tablet
· Fairly high technology literacy in adults

From these findings, six personas were created for Thrive:

Persona One
London Smithson
Three years old, African-American

Interests: Her pet cat, coloring, and riding her scooter
Screen Time per Week: 10-15 hours

About London:
London lives at home with both parents and an older sister. Her favorite thing to do is read with her mom, Cynthia. London attends day care full-time but is not in a formal school setting quite yet. She is definitely ahead of the curve when it comes to being prepared for kindergarten. Since she has an older sister, she spends a lot of time watching the same content as a 10-year-old and is pretty tech savvy for a 3-year-old.

Persona Two
Cynthia Smithson
Thirty-five years old, African American

Interests: Nursing, crafting, and working out
Screen Time per Week: 40 hours
Goal: To diversify her child's educational screen time with other applications

About Cynthia:
Cynthia has been married for seven years with two children – Sawyer, who is 10, and London, who is three. Cynthia is a nurse who works part-time and loves to spend as much time with her children as possible, since her husband works in health care and is not home as often. She never used a lot of technology when Sawyer was London's age and would like to explore how Thrive and other e-books and interactive applications could help London excel once she is ready for school. London does not seem behind in hitting any of her milestones, but Cynthia would like to stay ahead of the curve as she sees how important technology is these days.

Persona Three
Sam Craft
Four and a half years old, Asian American

Interests: Soccer, superheroes, and Peppa Pig
Screen Time per Week: 7-10 hours

About Sam:
Sam lives at home with his mom, Laura, and has no brothers or sisters. He has lots of friends at his daycare but prefers to 'play' instead of learn. He sometimes gets distracted when put in setting where he needs to focus for a long period of time. Sam is great independent player and can entertain himself at home with imaginary play and enjoys spending time at home.

Persona Four
Laura Craft
40 years old, Asian American

Interests: Cooking and baking, knitting, and murder podcasts
Screen Time per Week: 25 hours
Goal: To work on Sam's milestones where he is struggling

About Laura:
Laura is a single mom and has one child, Sam. She is recently divorced, and her main goal is be the best mom she can to Sam. Laura is not particularly tech savvy, but they use tablets and interactive learning at Sam's daycare center. She recently noticed that Sam is having some issue writing his numbers and letters correctly and is slightly concerned since he will start kindergarten soon. She is looking for anything that can help Sam prepare for kindergarten and being in a school setting. She is eager to get him on track but is unsure where to start.

Persona Five
Rosa Johnson
Seven years old, Caucasian

Interests: Makeup, swimming, and learning cursive
Screen Time per Week: 20 hours

About Rosa:
Rosa is just starting second grade at a new school. She is feeling a little nervous about it but enjoys a challenge. She has always excelled at school and finds learning new things comes fairly easy to her. Rosa is self-proclaimed girly girl, as she has two brothers and they enjoy video games and sports. She loves spending time with her family.

Persona Six
Doug Johnson
Forty-five years old, Caucasian

Interests: Ice-hockey, reading and Mexican food
Screen Time per Week: 60+ hours
Goal: Looking for a fun activity for Rosa when she has free time

About Doug:
Doug and his wife Mary are both teachers and keep education as a priority at home. They have three children together – John, Henry, and Rosa – and all three of them are excellent students. Technology is used in the home quite a bit and all the Johnson kids love using a tablet to play games when they have free time. However, Doug strictly patrols the content on their children's tablets and make sure that they only have access to educational and appropriate content. The children do not have access to YouTube, but Doug is very open-minded to trying new ways to learn.

For complete personas, see appendix B

Pedagogy

The method of teaching for Thrive is based around the use of a "self avatar," dialogic reading, and appealing to the three learning types of children. Its primary goal is to assist in attaining age-appropriate milestones in a fun and interactive way. This is achieved through storytelling that focuses on whatever milestone the child is working on and then completing an interactive "test" to see how much of the material they have understood. Once they have successfully completed that test, the user will receive a reward for their avatar from an accessories closet. They can choose to change clothes, add to their accessories or include a pet. Once the user passes that milestone, they can move on to the next one; however, they are able to work on different milestones concurrently so that they are not discouraged from working on it.

There is also a section for games and activities for users. This is intended to make the experience more engaging and allow the user to feel more like they are "playing" rather than "learning." However, games and activities also revolve around milestones and the child's "self avatar" and are merely another avenue to work on developing different milestones. For example, games may include tracing their letters or numbers, simple addition or subtraction, or sight words, depending on the child's age range. There is also a coloring section to further develop color identification and fine motor skills.

Information Architecture

In order to identify the functionality of Thrive, a general list of application features and actions were defined. This was done to better understand the goals of the users and design choices that would need to be made throughout the process.

Function Requirements
- Sign in and log in
- Avatar build

· Milestone exploration
· Interactive test
· Games and activities
· Reward system for completed milestones
· Parents section
· Edit avatar
· Adding another child/sibling

User Roles

There are two primary roles within the Thrive application. The primary user role is the child working on the milestone. The primary facilitator role is the parent or caregiver who would incorporate Thrive into the primary user's educational routine. Below are lists of the user's interactions with application based on the function's requirement list.

Child
·Build avatar
·Explore milestones
·Complete milestones (either with or without helping to read)
·Interactive test
·Games and activity completion
·Receive rewards for milestone completion

Parent or Caregiver
·Sign up and log in
·Assisting with building avatar (if needed)
·Assist in milestone stories reading
·Parents section
·Edit avatar (if needed)
·Adding children/siblings (if needed)

The Site Map

The Thrive site map places each of the primary functions on adaptive learning and linear path. Mile markers are used as stopping points for milestones from which users can move forward or backward, and top navigation is included to illustrate users' access to additional content.

At the top of the site map is the sign up and login, which is only needed once. Once users are signed up and logged in, they will not need to log out. The account is connected to the parent or caregiver email, as the primary users will be too young to manage an email account. Once logged in for the first time, users will be required to build an avatar. The application will take the user step by step to choose head shape, skin tone, hair style, hair color, eye shape, eye color, nose, mouth, and clothes options. Users can move back and forth to change options as they see fit; however, after the last clothing choice any edits will need to be made in the parent section. Upon opening the app after the initial build, users will start at the home page where they simply choose which child is using the app at time.

Once the user's avatar is complete, it will automatically populate on the milestone path. Users can choose any mile marker to start. Each marker is personalized to the user's age and contains a different milestone story for the user to work on. At the end of the story, users will be prompted

to answer a couple questions about the story/milestone to ensure that the content covered was understood. Users may attempt them as many times as needed. Once a milestone has been successfully completed, the user will be moved to an "avatar closet" where they can choose a reward for their avatar. Users can move freely among milestones but will only be rewarded for ones where the interactive test is complete.

The game section includes areas for users to work on letters, numbers, and creativity. Each section is populated with the personalized avatar that the user has built and is also customized for the age of the user. Games and activities are based upon learning level, which is determined by age. These can also be completed as many times as necessary for the user, and there is not a "testing" system in place for this feature.

The last section is for settings and parents. This is where you can add another avatar or child, learn more about the applications objectives, find any updates, or read the terms of service.

For complete site map, see appendix C

User Testing

Understanding a Younger Audience

Since young children needed to be tested for the development of Thrive, it was important to see how testing environments differ from age to age. In March 2018 there was an opportunity presented to observe some testing through Kidsteam through the University of Baltimore. I was able to observe children from the age of 6-12 help create a library book drop off system. There were about 10 participants, as well as two facilitators and me as an observer. Testing with a younger audience can differ greatly from other user groups, this is because children and teenagers tend to get distracted more easily than adults, they often read at a lower proficiency level, and their research capabilities are inferior (Joyce 2019).

Children were asked a series of questions and answers written on sticky notes and adhered to a wall for the group to see. As each child came up with an idea, they were often asked to elaborate and then praised or thanked for their participation. Once all the sticky notes had gone up, the facilitators then started to edit the idea with the help of the children until the group decided on a final "idea." Once complete, participants were rewarded with a snack.

It was helpful to see a test of this nature before conducting any user testing on my own. It was clear that young children are not the best at thinking aloud and the role as the facilitator would be essential. It is important to know that when working with a younger age demographic that special considerations may need to be made, as in language used, time frames, and the involvement of parents or caregivers.

User Testing Preparation

Before I tackled my testing with children there were many formal steps that needed to take place for the protection of my data and well as the participants. Since children cannot give their own

permission to participate in a study, I had to formulate and disperse a consent form to caregivers. This outlined the purpose, procedure, risk and benefits, confidentiality, and necessary contacts.

I also formulated a recruiting description and interview questions to prepare for my Institutional Review Board (IRB) application process. The IRB is set up to review and monitor research involving human subjects. Due to my participants being underage, the documentation for Thrive was presented and approved for a full board review in February 2020. I was also required to complete Collaborative Institutional Training Initiative certificates for Student Researchers and Common Rule. This was implemented by the University of Baltimore to ensure that student researchers understand the human subject protection, ethical issues, and current regulatory information needed to do research.

For complete IRB documentation, see appendix D

Digital Wireframe/ Low-Fidelity Prototype

Wireframing was the first low-fidelity prototyping method used to create Thrive. Using paper and pencil, sketches were produced based on the site map. Things like navigation and general layout were investigated. However, most importantly, ideas about how many features to include in the avatar build were decided in this step. The goal is to have the avatar look as close to the user as possible but also not overwhelm the user with choices.

Once there was a better understanding on how to test a younger age range, a simple digital wire frame was created in *Balsamiq* based upon the existing paper sketches. This was intended to be used as a blank slate to complete paper prototyping with the children and parents that had been recruited for testing. The main focus was to test the avatar build as this feature makes Thrive unique.

During this testing that took place over the end of 2019 and beginning of 2020, there were two primary goals with this digital wireframe. First was to ensure that users could see themselves in the avatar that they built, and second was to determine whether there were any essential features missing from the build. Once the initial design was completed in *Balsamiq*, all feature options were taken out of the screens so that they could be drawn in with a facilitator. Because there are so many options with human facial features, it would have been too time consuming to build out digital representations; therefore, as the user made choices, we manually drew those options in.

Each child was given a printed picture of a "persona" and asked to make selections based on the picture. Once they made a selection, I would draw the selection out for them, and the participant would color it in themselves. This drastically helped with engagement as children felt as though they were really building something themselves.

Three users were tested with the low-fidelity prototype/digital wireframe ranging from four to nine years old. Follow-up questions included:

1. Do you see the options you want for this persona?
2. Does what we created look like the picture?

Generally, users could see their persona in the drawing we completed. However, some features either seemed to be more important or less important to some participants. Each participant was given five options of head shape, skin tone, hair style, hair color, eyes, nose, mouth, and shirt color. Comments about features included wanting to see more defined eyebrows and ears and one participant even said that the finished product looked very similar to one of his friends. Overall, participants could see the given persona in the drawing but wanted more details.

As a follow up, participants were asked to draw a picture of themselves as closely as possible. This proved much harder for the child to see themselves than a picture of someone else. Especially considering they were working under the constrictions of their own artistic aptitude, it seemed much more difficult to see themselves in the drawing. Because this testing was done by drawing, I did take into consideration that the end result avatar is a form that can be altered, multiplied, discarded, or exchanged at the will of the user, where a drawing cannot. Thus, there was a higher priority to see how this would play out with the high-fidelity prototype.

For complete digital wireframe, see appendix E
For complete low-fidelity prototyping user testing, see appendix F

High-Fidelity Prototype

During COVID-19 I had a very difficult time recruiting participants and their parents to participate in any additional paper prototype testing in person. Because it was extremely interactive, I was unable to recruit anymore paper prototyping participants and became more focused on my digital prototype. Using the digital prototyping software *proto.io*, I set out to create a testing environment. The original design set out to have six options for each feature. However, after diving into the project, I realized that over 500,000 screens would be needed to make that possible. In order to test efficiently with children, it was necessary to make sure it was fully functional, and all choices were able to be built out, so I needed to come up with a better and more time-saving option than *proto.io*.

At this point, I reached out to Miguel Montanez, Co-founder and Chief Creative Technologist at Makefully studios in Kansas City, to assist with problem-solving how to create an environment of this nature. Because of time restrictions and software limitations in *proto.io*, I decided that coding this from scratch would be the best solution for testing. I provided the design and assets and Miguel was able to make all the connections for me.

I also needed to make some essential design choices before testing. Because of the scope of work with the testing environment and the intention to be gender-inclusive, Thrive does not ask users to make a gender choice in the avatar build. All boy and girl options are mixed together, leaving it up to the user to decide what option they would like instead of being boxed into a "boy" or "girl" category.

Text was also purposely left out. Since more than half the users are unable to read, the avatar build does not include labels for features. This was intended so that it would not intimidate the users and encourage them to build on their own. Multi-step directions are already cognitively demanding for a child, so I wanted to make it as simple as possible during testing and beyond.

Over September and October 2020, I was able to complete the high-fidelity testing environment that included only the avatar build. I was able to complete three in-person testing scenarios with children ranging in age from four to six years of age and three over Zoom with children ranging from three to seven years of age. All six included parent participation and consent forms. Because this prototype was completely digital, I was able to send it out via Facebook and email with a Google Forms survey to hopefully capture additional participants. I was able to get feedback from three additional participants that way.

Two participants who were included in the low-fidelity test were also included in the high-fidelity test. There were much higher engagement rates with participants with the digital test, which was even more obvious from the two participants from the previous test. Four of the six participants even spent additional time after the test playing with the prototype and building characters.

Participants did not mention the level of detail that they did in the low-fidelity prototype. However, hairstyle and clothes were the two main features where children seemed to see themselves the most. Each seemed to be looking for something very particular when choosing those features, and if they did not see it, they expressed that.

Outside of the identity, ease of use was my other main concern. I found that the younger children in my age range had an easier time navigating the avatar build, where children slightly older asked many more questions about what they should do next. However, the entire age range seemed to have little to no issues with navigating their way through the build.

Follow-up questions for the child included:
      ·Did you have enough features to make this look like you?
      ·If not, which ones would you like to see?
      ·Did you enjoy this process?

Follow-up questions for the parent included:
      ·How much screen time is your child getting per week?
      ·Is your child familiar with avatar building apps?
      ·As a parent, do you feel like this a good representation of your child? Why or why not?
      ·Did you enjoy this process?

For complete high-fidelity prototyping user testing, see appendix G

Content Development

When developing content for Thrive, I wanted to make sure that I was communicating efficiently with my audience. I had to ensure that content was easily digestible for children while still keeping

parents in mind. Because Thrive is a tool that partly helps children prepare to read, writing is kept brief. Milestone e-books correspond with age and reading level and are kept visually heavy. Visuals are colorful, bright, and large to help with engagement of children within the preoperational age and improve pre-literacy skills.

Storytelling/Gamification

Gamification is important when keeping a child's attention. The idea of incentivizing a child when learning is a viable trend in education and seems to work wonders. The growing popularity of gamification is stemming from the belief in its potential to foster motivation, behavioral changes, friendly competition and collaboration (Dicheva 2017) with young minds.

Touchscreen interaction, interactive "tests," coloring pages, an adaptive learning path, tracing, are all gamification elements incorporated into Thrive. In the "games" section, users are purposefully engaged in learning that is disguised as play. The purpose is that each lesson (or game) provides practice and repetition while introducing new concepts in a fun and effective way. Storytelling is done with the same intention. Users can follow along with the e-book, watch themselves complete the milestone, and then test themselves on understanding the content.

Website

Writing for the website is designed to be informational and sales-based. The goal is for potential users to visit the website, learn about it, and hopefully download it. This deliverable is intended for adults, so the content is more text-heavy than the application. Nevertheless, the language is meant to be easily digestible, simple, and to the point.

The website is also likely the first place a parent will be introduced to the content of the application, so it was important to make sure that the visitor gets a good understanding of the brand and visual identity of the application. With this in mind, the website is also very illustration-heavy.

DESIGN & DELIVERABLES

The Name

For this type of product, I wanted to make sure that the name reflected the core values of the content, was short but memorable, and connected with my audience's motivations. I considered many plays on the term "growth" or "grow." Terms like "sprout," "bloom," and "flourish" were all up for discussion, but many of those are commonly used in the child educational realm, and I wanted to make sure to stand apart from the existing market.

I ultimately decided on Thrive, which is a term centered around growth. Its literal definition is "grow or develop well or vigorously." It symbolizes the essence of the main goal of the app, which is to help a child grow. It embodied the values of the application but also had a clever essence to it, which helped solidify my decision. I then ensured there were no other applications with that name in this area. Most applications or websites with the name Thrive revolved around financial planning, and I found nothing in the educational space.

Mood Board

To help me make decisions on how to design my brand for Thrive, I created a mood board very early on. I collected images, text, and other inspiration to illustrate the visual style of Thrive. I kept up with this using Pinterest, Google, and Instagram searches. During the design process, I continually looked back to my mood board to redirect or remotivate myself. This helped me stay consistent to my vision.

For complete Mood Board, see appendix H

Style Guide

A style guide is a deliverable used to define type choices, colors, and interface elements that communicate the design language of the brand. Creating this document helped in making sure that all my assets worked well together and translated in other areas.

Type
Two main fonts were used for Thrive's brand identity and another for logo development:

Source Sans Pro: Designed by Paul D. Hunt for Adobe in 2012. It is a grotesque san serif and the first open source font family from Adobe. There are 12 weight variations and is used as Thrives primary font.

McLaren: Created by Astigmatic One Eye Typographic Institute, McLaren is used as Thrive's secondary font, or title font. It comes in one weight but is a go-to comic style lettering for children, comics, and anything requiring a mildly playful yet clearly readable font. As a popular Google font, it is very accessible for web and print.

Asparagus Sprouts: Designed for free and personal use by Brittney Murphy, Asparagus Spouts is used

as the main text for the Thrive logo. As a handwritten font, it brings varying stroke weight to give lots of character. This was manipulated to create the Thrive logo.

Colors
A color palette was inspired by the rainbow, as the audience is children. Incorporating bright colors in both a light and dark version was important to being able to create illustration assets as well as gradients. Because of the connotation of the name, a green shade was chosen as the main color. It is gender-neutral, calming, and appealing to all audiences.

Illustrations
All illustrations were either selected from stock resources or created by me in Adobe Illustrator®. Illustrations were created to make every feature for the avatar build as well as the accompanying assets in milestone stories and other parts of the application.

Icons
Icons are a simple way to represent something unique. The main icons are just the mile markers that have been created in every color from the color palette. These are seen throughout the application but is also used as the icons main download applications image.

For complete Style Guide, see appendix I

The Logo

In creating my logo for Thrive, I started with traditional pencil and paper and began to sketch my own visual interpretation of the word Thrive. Because of its meaning, many of the sketches involved plants and greenery as well as mile marker pins, since the application builds with milestones. The goal was to marry the idea of growth and avatars. I came up with two drafts of application icons that I wanted to test with parents, asking them which one they preferred and were more likely to download. Both were map pins with a play on a leaf designs while one incorporated monster eyes. Almost 90% of the feedback was that the monster eyes did not translate, and users would download the mile marker/leaves as opposed to the monster eyes. I did want to incorporate the plant aspect of growth, but I did not want it to be so obvious, so I literally went back to the drawing board and decided to focus more on the word Thrive.

Brand recognition was the main goal for the Thrive logo, however I made sure to take many things into consideration. It needed to be versatile, legible at any size, work across all media, and look good in black and white or monochrome. This led me to create a logo mark (especially for the use of the application icon) and a logotype. Each one can be used together or separately to represent Thrive.

Ultimately, the end result was the mile marker pin that has a nondescript avatar inside. This symbolizes the journey of hitting milestones through the mile marker as well as drawing attention to the uniqueness of the use of avatars. The logotype is the word Thrive in a child friendly font that I manipulated, with the mile marker being used in the "I." I also incorporated some texture and fluidity within the text to represent the different levels of the application and its intention to actually grow with the user.

For complete logo process, see appendix J
For complete Final logo, see appendix K

The Prototype

The Thrive prototype developed has two parts. First, there is the avatar builder, which focuses on creating a persona or "self avatar" that a user can identify with. Second is the milestone application where users can see said avatar play out certain milestones in order to better understand and develop the associated skills. The final prototype applies research knowledge and various rounds and types of user testing. Thrive was built in *proto.io* software.

The Avatar Build
The avatar build was the most complicated and unique portion of the design process. Each feature was completed as designed as a separate asset and grouped to be displayed with any other feature chosen by the user.

> *The final build includes:*
> · Six head shapes
> · Six skin colors
> · Six hair styles
> · Five hair colors
> · Three eye shapes
> · Five eye colors
> · Four noses
> · Three mouths
> · Six clothing options

Each option is interchangeable and instantly changes on a tap command. I created over 300 .svg assets ranging in skin tone in order to create these options. Because of the use of so many colors and varying skin tones, the background was left neutral and simple. The navigation was also kept simple and straightforward with back-and-forth buttons at the top of the page. These have been highlighted in blue in order to complement the primary green color and pop out for the user.

For complete Avatar Build Prototype, see appendix L

The Milestones
Once the user completes their avatar, their home screen will populate with their character. This section of the prototype was designed to feel like a totally separate world that a child can explore

either with a parent or independently. The milestone portion is meant to be an adaptive path, where the user can move back and forth from milestone to milestone as they please.

Background design moves with the user and is playful and bright. Because of Thrive's audience, navigation is simply two buttons at the top for settings and for games. I also added the element of audio to describe what the user should be doing next. This was intended to help with independent play. This can be found at the start of application as well as during each story and test. This section also includes music which changes as you move from milestones to stories to games. This promotes engagement within the application but also helps define three separate areas for the user.

Milestone Objectives

The milestone objectives define what is expected from users as they interact with Thrive. Upon the completion of each milestone, users will demonstrate general comprehension of said milestone depending in their age range. Below are some of the included or intended milestones currently in Thrive based on the developed personas:

Ages three to four (London):
·Cognitive Development: Can correctly name familiar colors.
·Sensory and Motor Development: Can help put on and remove clothing.

·Social and Emotional Development: Shows empathy and concern for crying friend.
·Social and Emotional Development: Engages in imaginary play and is able to distinguish fantasy from reality but enjoy playing make-believe and dress-up.
·Thinking and Reasoning Development: Can point out familiar things. Able to know what household objects are used for, such as money, food, or appliances.

Ages four to five (Sam):
·Thinking and Reasoning Development: Understanding the basic concepts of time like the difference between morning, afternoon, and evening.
·Social and Emotional Development: Apologizing. Begins to say sorry when appropriate.
·Fine Motor Development: Able to write some small and capital letters from the alphabet.
·Sensory and Motor Development: Hopping on one foot.
·Fine Motor: Can identify and copy triangles and other geometric shapes.

Age seven (Rosa):
·Language Development: Begin to see that some words have more than one meaning.
·Social and Emotional Development: Knowing the difference between right and wrong.
·Thinking and Reasoning Development: Can easily know their right from their left.
·Thinking and Reasoning Development: Can count backwards.
·Social and Emotional Development: Manages emotions better, especially in public situations.

For complete Milestone Prototype, see appendix M

The Website

When I began this project and started the name process, I knew that I may have a difficult time obtaining a domain name with the name Thrive in it, as it is very popular. Thrive.com was not being utilized but was not for sale. I did, however, want to be more specific in my domain name since Thrive is something intended for children. I looked for variations of the word "thrive" and "milestones" and eventually ended up with *thrivemilestoneapp.com*.

This was the last element developed for Thrive and is meant to house any information for parents and potential users. I used the content management system *WordPress* and the theme Avada to build the website. I used a 100% responsive page layout to ensure that website worked well on a desktop and mobile device. I applied all design aspects from the style guide in order to make sure the brand identity was the same on the website as it is in the application.

The home screen offers a place to download the application, helpful hints about features, and reviews from other parents/users. There are two additional pages for donations in order help fund continual development of the application and a login screen for parents that they can access either directly in the application or on the website.

For complete Website Design, see appendix N

Limitations

The only major limitation of the prototype is the density of the avatar build. The goal of Thrive is create an avatar that is personalized and is something that the user can truly identity with. In order to successfully achieve this, there need to be many options. Because of time constraints and certain limitations in *proto.io*, only a portion of the options are available in Thrive. But with further development, the idea is to have many more options for users in the future.

EXPANSION & DISTRIBUTION

This is only the beginning for Thrive. With more time, additional resources, and the help of investors, further exploration and development of Thrive can help it reach its maximum potential. The content for avatars and milestones is boundless and can be continually made better. Since this application is intended to grow with the user, it is something that has a very long shelf life for a family/user.

To be further developed:

Milestones
·More stories per user, or an option that once one story is complete, the user is given another one to work on
·A solution to request certain milestones to populate for the user

Avatar
·More options for each feature with a scroll element
·Further development of hair and clothing options
·Eyedropper color picker for skin tone and hair color
·More accessibility accessories (wheelchair, glasses, freckles, etc.)
·Availability of accessory updates as avatar completes milestone tests

Design Elements
·Animation in the background of the path (birds and clouds moving, pins bouncing, etc.)
·Dynamic change of seasons to correspond in home screen and in games

Audio
·Options to read milestone stories alone or have them read aloud
·Child voice recordings for all audio
·Interactive directions for games as users play

Website
·SSL certificate for SEO purposes
·Animation in elements across site

Distribution Plan

With little research available about "self avatars," my intent will be to properly and effectively display my research, with my first priority being to publish my work. I believe that this could be done through both design and psychology publications. CyberPsychology & Behavior, Digital Education Review and Interaction Design and Architecture would be a few examples of fitting places for this research. I will submit a brief abstract and some other basic information to see if these academic journals would be interested. Aside from print publications, my work and possible end experiment could be used for a study at a conference. Conferences like The Interaction Design and Children and the Computer Supported Collaborative Learning would both be excellent choices to submit my work for large groups and a broader audience.

To have this idea and research come fully to life, the complete application would need to be built. This would involve funding and time, which could be submitted through app funding sites like AppsFunder and Mobile App Fund. I have already reached out to my contact, Miguel Montanez, who works in the field and helped with the testing environment. He is very impressed with the idea and execution of Thrive thus far and expressed interested on working on this further with me. He is a great resource for any needed connections or assets for further development of Thrive.

Project Costs

At the beginning of this project, my anticipated costs were about $1,000. However, a lot of the resources used ended up being things that I already owned or that I had access to through my job, which helped tremendously with my budget. Most of my expenses were due to monthly subscriptions for software and for hosting of the website; however, I was able to get student discounts for many of them. As a result, I came in well under my anticipated budget.

Project cost included:

Google Forms	$0.00
Balsamiq	$89.76 *for a year subscription with student discount*
Proto.io	$63.00 f*or subscription with student discount*
Adobe CC	$0.00 *already owned*
Testing Space Build	$0.00 *donated*
Shutterstock	$0.00 *already owned*
Hosting	$83.88
Domain	$11.99
WordPress	$0.00
Avada Theme	$60.00
Editing Service	$100.00

The Conclusion

By finishing this reasearch and project its is clear that there is a significant need for this engageing and interactive tool in the market. Not only is Thrive utilizing avatars in a way that is new and exciting for children but it also provides a new avenue for parents and caregivers to engage in their childs education and learning experience. Technology is an ever present medium in our children's lives and its important to make it worth while, effective and fun.

Acknowledgments

This is for my three girls.

I have either been pregnant or gave birth to all of my children throughout the process of this thesis and the topic was directly inspired from starting out my journey as a mother. My hope is that as they grow older, they see the completion of this project as an achievement that as a woman or a mother you can do anything, no matter how hard or how much is on your plate.

A special thanks goes out to my husband, Zach, who arguably worked harder and sacrificed more than I did to complete this work over the last couple years. I couldn't have done it without you. I love you.

And of course, to my committee members, Megan Rhee, Greg Walsh, David Patschke, and Amy Pointer. Thank you for reminding me that I am writing a chapter and not a book, for your valuable feedback, direction, and kind words of encouragement.

Thank you to Miguel Montanez, who really came through during the stressful design moments to assist me with development that was beyond my comprehension and was always a source of calm and inspiration. To Kelly O'Shea who gracefully edited this paper for me. I am so grateful for you.

I'd also like to thank my family, friends, co-workers, everyone who has been in my thesis cohort over the last couple years and all the parents and children who participated in testing. Even if the contribution felt small to you, it made a huge impact on me and this project.

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APPENDIX

Appendix A
Survey

I am a...

109 responses

- Parent
- Teacher
- Aunt, Uncle, Grandparent, Friend of a Kiddo

84.4%
8.3%
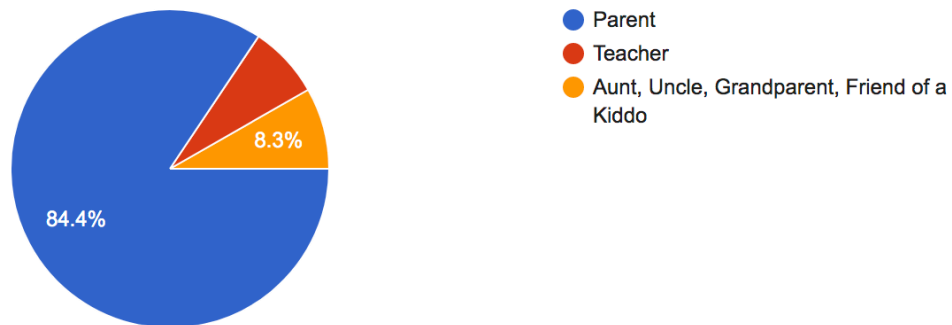
My child, or child I work with/spend time with is...

109 responses

- Under 1
- 2-4 yo
- 5-7 yo
- 8+

20.2%
11.9%
65.1%
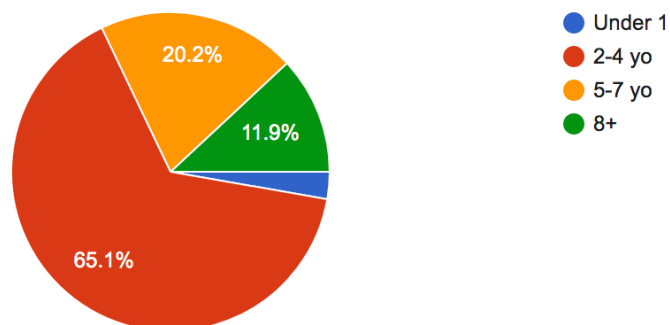
Does your child have access to a tablet or phone with apps?

109 responses

- Yes
- No

9.2%
90.8%
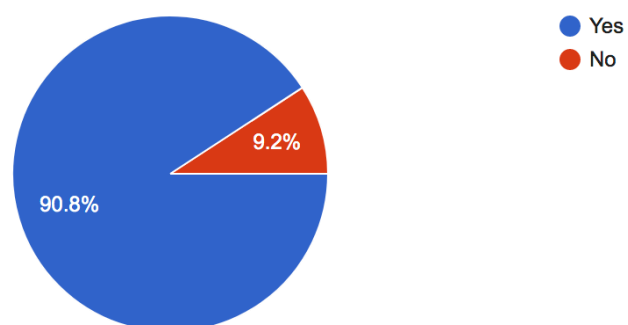
If not, why?

11 responses

·I don't let my children use my phone and we don't have a tablet.
·They dont need it
·We don't allow screen time in the classroom.
·The AAP recommends no screen time until a child is at least 2 and we are trying to follow that guideline
·Limits physical activity
·He has access in that I own a smart phone and he is occasionally allowed to play with it
·Trying to protect him from screens while I can before his life is basically lived through them like everyone else's.
·Negative effects of brain development and electronic usage. Only watches TV for a limited numbers of minutes per week.
·Their parents don't allow that
·Yes But we only use it like twice a month. I would rather her do fine motor activities like real puzzles or coloring and cutting. Or god forbid.. use her imagination
·No way to filter downloaded content

If so, how many children's apps do you have on your phone or tablet?

109 responses

Legend:
- None
- 0-3
- 4-6
- 7-10
- 10+

Pie chart values: 33%, 18.3%, 11.9%, 23.9%, 12.8%

How much time does your child spend on a phone/tablet per day?

109 responses

- None — 14.7%
- Less than an hour — 45.9%
- 1-3 hours — 34.9%
- 4+ hours
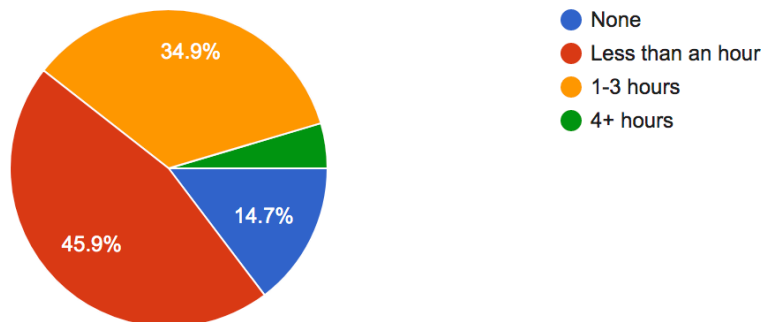
What is the top quality you are looking for when downloading an app for your child?

109 responses

- Educational — 69.7%
- Distraction
- Fun — 16.5%
- I don't download apps for my kids.
- I am not looking
- both educational and fun
- Not applicable
- all of the above
- NA
- We don't really use apps other than YouTube Kids.
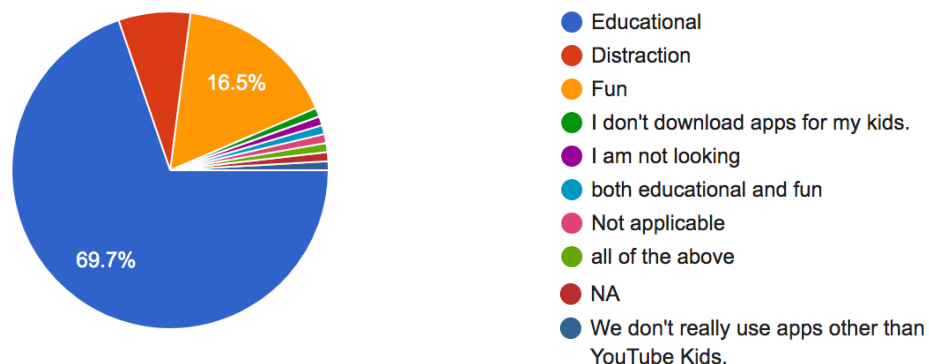
How do you research a child's app?

109 responses

- App Store or Google Play Reviews — 39.4%
- Referral from a fellow parent/teacher/friend — 38.5%
- Advertising on TV
- I don't — 21.1%

Do any current apps you have for your child use avatars/bitmojis?

109 responses

- Yes
- No

86.2%

13.8%
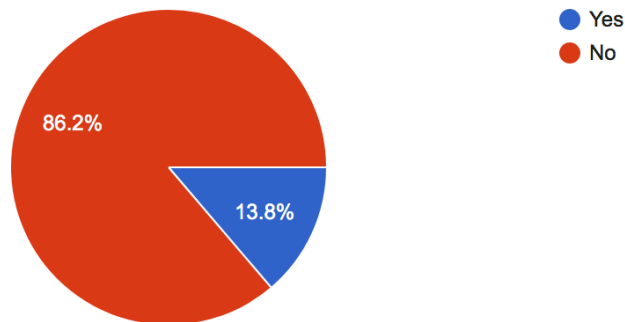
If so, which apps?

14 responses

·Instagram
·snapchat
·Snapchat with parents
·Snapchat
·Road blocks
·Teach Your Monster to Read
·ABC mouse.com
·Barbie
·ABC Mouse
·Class dojo
·Xbox Live has a 3D avatar creation feature similar to this.
·disney now
·ABC mouse
·We don't actually understand how to utilize the avatar feature but I think it's on one or two of the Barbie type apps she liked.

Would your child enjoy creating themselves as an avatar/bitmoji?

109 responses

- Yes
- No

85.3%
14.7%
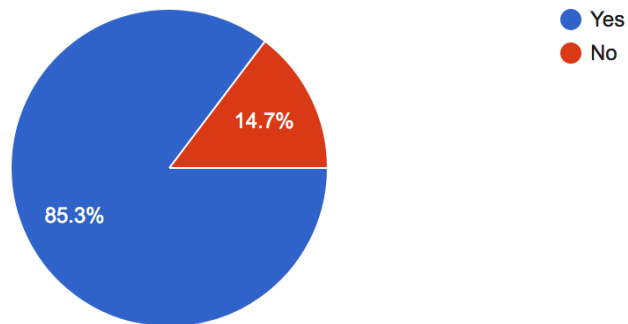
Do you ever read to your child on a tablet via ebook or other storytelling apps?

109 responses

- Yes
- No

86.2%
13.8%

If not, why?

68 responses

20 (29.4%)
2 (2.9%)
1 (1.

Because I try to…   He won't let me   I'm a high schoo…   Prefer books   Want to stay tra…   We read real bo…
Don't have any   I just use books…   Old school, pref…   The iPad (so far…   We like books, r…   Won't sit still lo…
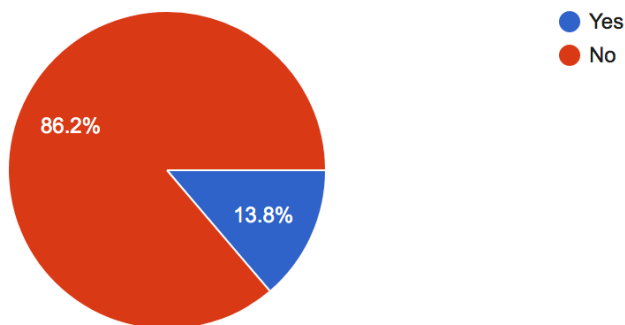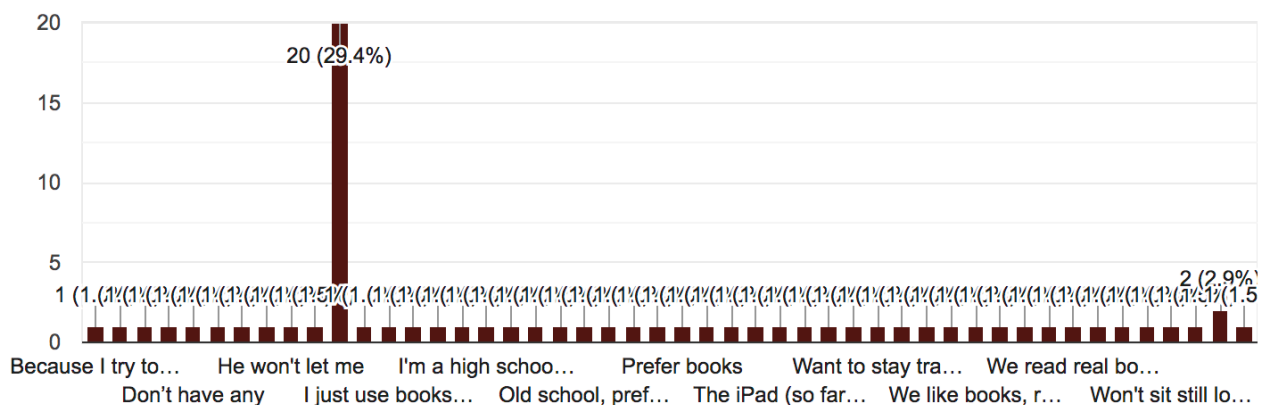
Appendix A
Survey (Continued)

If so, which apps?

9 responses

·Amazon
·Kindle and Overdrive
·Monster book
·iBooks
·Audible
·YouTube
·YouTube
·Epic
·I read Winnie the Pooh on iBooks

Do you believe that tablet usage helps your child understand content better?

109 responses

Yes
No

34.9%

65.1%

If not, why?

22 responses

What are some milestones your child could use help achieving? (Please specify if not included here)

109 responses

Milestone	Count (Percentage)
Brushing Teeth	47 (43.1%)
Potty Training	50 (45.9%)
Learning Colors	20 (18.3%)
Recognizing Body Parts	14 (12.8%)
Writing Letters	69 (63.3%)
Tying Shoes	61 (56%)
Putting Objects in Order	42 (38.5%)
Telling Time	66 (60.6%)
Math facts	9 (8.3%)
Reading	2 (1.8%)
Becoming a fluent reader	1 (0.9%)
Grammar, narrative writing	1 (0.9%)
None	1 (0.9%)
long division	1 (0.9%)
short vowel words	1 (0.9%)
Music notes and penmanship	1 (0.9%)
Time management	1 (0.9%)
Reading and Writing	1 (0.9%)
Talking	1 (0.9%)
Counting money	1 (0.9%)
	1 (0.9%)
Numbers	1 (0.9%)
	1 (0.9%)

What types of content does your child like to digest on a tablet/phone? (Check all that apply)

109 responses

Category	Value
Educational Games (Literacy, Math, ect)	68 (62.4%)
	40 (36.7%)
Drawing/Doodling Games	46 (42.2%)
	16 (14.7%)
Interactive Stories/eBooks	13 (11.9%)
Toy Reviews/YouTube Videos	34 (31.2%)
	54 (49.5%)
Pictures from the Camera Roll	58 (53.2%)
None at this time	1 (0.9%)
They don't have access to this.	1 (0.9%)
None	1 (0.9%)
vape tricks	1 (0.9%)
Sago, PBS Kids, Pokemon	1 (0.9%)
He doesn't digest any.	1 (0.9%)
Trucks or cars	1 (0.9%)
blippi	1 (0.9%)
	1 (0.9%)
Vape trick videos	1 (0.9%)
Disney Now/Jelly Telly	1 (0.9%)

Appendix B
Personas

Persona One
London Smithson

Three years old, African-American

Interests: Her pet cat, coloring, and riding her scooter
Screen Time per Week: 10-15 hours

About London:

London lives at home with both parents and an older sister. Her favorite thing to do is read with her mom, Cynthia. London attends day care full-time but is not in a formal school setting quite yet. She is definitely ahead of the curve when it comes to being prepared for kindergarten. Since she has an older sister, she spends a lot of time watching the same content as a 10-year-old and is pretty tech savvy for a 3-year-old.

Persona Two
Cynthia Smithson

Thirty-five years old, African American

Interests: Nursing, crafting, and murder podcasts
Screen Time per Week: 40 hours
Goal: To diversify her child's educational screen time with other applications

About Cynthia:

Cynthia has been married for seven years with two children – Sawyer, who is 10, and London, who is three. Cynthia is a nurse who works part-time and loves to spend as much time with her children as possible, since her husband works in health care and is not home as often. She never used a lot of technology when Sawyer was London's age and would like to explore how Thrive and other e-books and interactive applications could help London excel once she is ready for school. London does not seem behind in hitting any of her milestones, but Cynthia would like to stay ahead of the curve as she sees how important technology is these days.

Persona Three
Sam Craft

Four and a half years old, Asian American

Interests: Soccer, superheroes, and Peppa Pig
Screen Time per Week: 7-10 hours

About Sam:
Sam lives at home with his mom, Laura, and has no brothers or sisters. He has lots of friends at his daycare but prefers to 'play' instead of learn. He sometimes gets distracted when put in setting where he needs to focus for a long period of time. Sam is great independent player and can entertain himself at home with imaginary play and enjoys spending time at home.

Persona Four
Laura Craft

40 years old, Asian American

Interests: Cooking and baking, knitting, and working out
Screen Time per Week: 25 hours
Goal: To work on Sam's milestones where he is struggling

About Laura:
Laura is a single mom and has one child, Sam. She is recently divorced, and her main goal is be the best mom she can to Sam. Laura is not particularly tech savvy, but they use tablets and interactive learning at Sam's daycare center. She recently noticed that Sam is having some issue writing his numbers and letters correctly and is slightly concerned since he will start kindergarten soon. She is looking for anything that can help Sam prepare for kindergarten and being in a school setting. She is eager to get him on track but is unsure where to start.

Persona Five
Rosa Johnson

Seven years old, Caucasian

Interests: Makeup, swimming, and learning cursive
Screen Time per Week: 20 hours

About Rosa:
Rosa is just starting second grade at a new school. She is feeling a little nervous about it but enjoys a challenge. She has always excelled at school and finds learning new things comes fairly easy to her. Rosa is self-proclaimed girly girl, as she has two brothers and they enjoy video games and sports. She loves spending time with her family.

Persona Six
Doug Johnson

Forty-five years old, Caucasian

Interests: Ice-hockey, reading and Mexican food
Screen Time per Week: 60+ hours
Goal: Looking for a fun activity for Rosa when she has free time

About Doug:
Doug and his wife Mary are both teachers and keep education as a priority at home. They have three children together – John, Henry, and Rosa – and all three of them are excellent students. Technology is used in the home quite a bit and all the Johnson kids love using a tablet to play games when they have free time. However, Doug strictly patrols the content on their children's tablets and make sure that they only have access to educational and appropriate content. The children do not have access to YouTube, but Doug is very open-minded to trying new ways to learn.

SIGN UP

AGE SELECTION

MILESTONES

Head Shape

Skin Color

Hair Style

Hair Color

Eye Shape

Eye Color

Nose

Mouth

Clothes

Appendix C
Site Map (Mobile Application Login)

```
                    ┌──────────────────────┐
                    │        LOGIN         │
                    └──────────┬───────────┘
                               │
        ┌──────────────────────┴────────────────────┐                    (Upon Successful Completion)
┌───────────────────┐                        ┌──────────────┐          ┌──────────────────┐
│    MILESTONES     │────────────────────────│   Story 1    │- - - - - │  Reward Closet   │
└─────────┬─────────┘                        └──────────────┘          └──────────────────┘
          │                                  ┌──────────────┐
   ┌──────┴──────────┐                       │   Story 2    │
┌───────────┐  ┌──────────────┐              └──────────────┘
│   GAMES   │  │  SETTINGS    │              ┌──────────────┐
└─────┬─────┘  └──────┬───────┘              │   Story 3    │
      │               │                      └──────────────┘
┌───────────┐  ┌──────────────┐              ┌──────────────┐
│   ABC's   │  │  MILESTONES  │              │   Story 4    │
└───────────┘  └──────────────┘              └──────────────┘
┌───────────┐  ┌──────────────┐              ┌──────────────┐
│   123's   │  │  Add Avatar  │              │   Story 5    │
└───────────┘  └──────────────┘              └──────────────┘
┌───────────┐  ┌──────────────────┐          ┌──────────────┐
│  Coloring │  │ Parent Resources │          │   Story 6    │
└───────────┘  └──────────────────┘          └──────────────┘
┌───────────┐  • Account Management
│ SETTINGS  │  • Edit Avatars
└───────────┘  • About Info
```
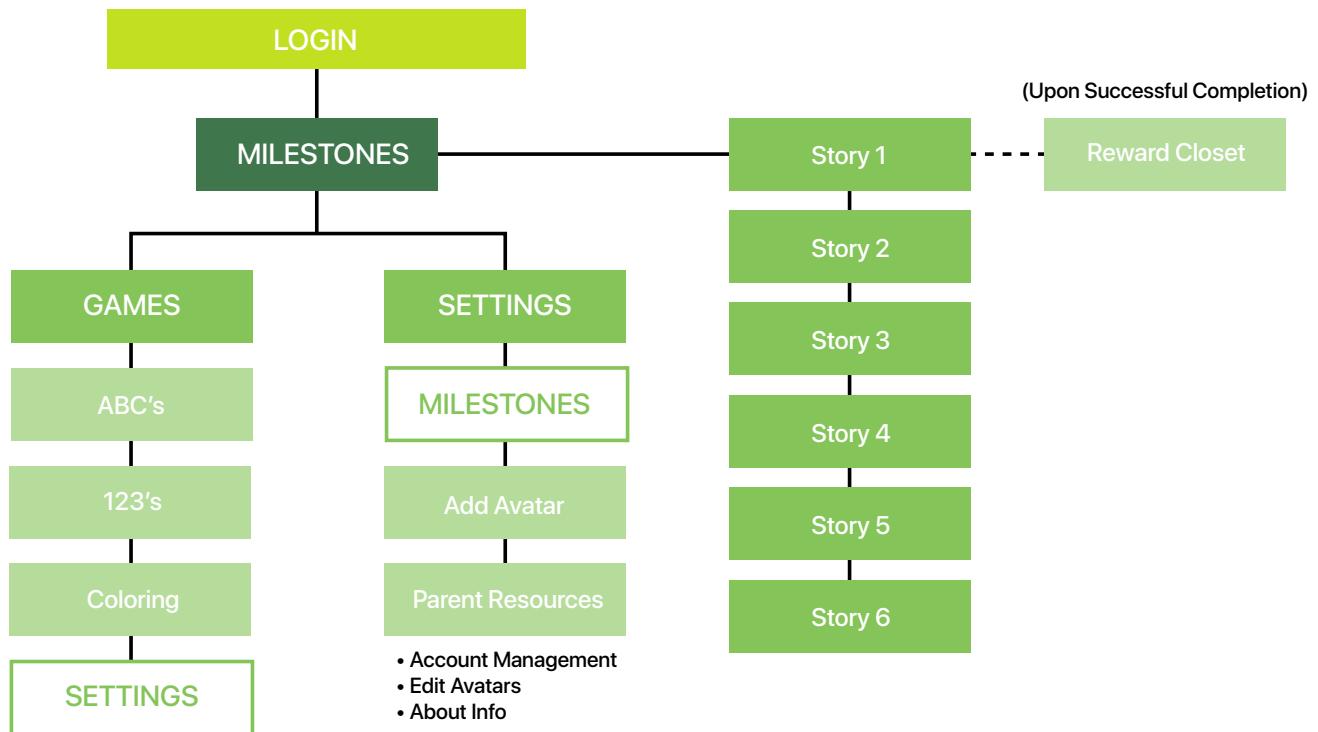
Appendix C
Site Map (Website)

```
DOWNLOAD - - - - HOME
                  |
        +---------+---------+
        |                   |
      DONATE             PARENTS
                            |
                          Login
```

ub
UNIVERSITY
OF BALTIMORE
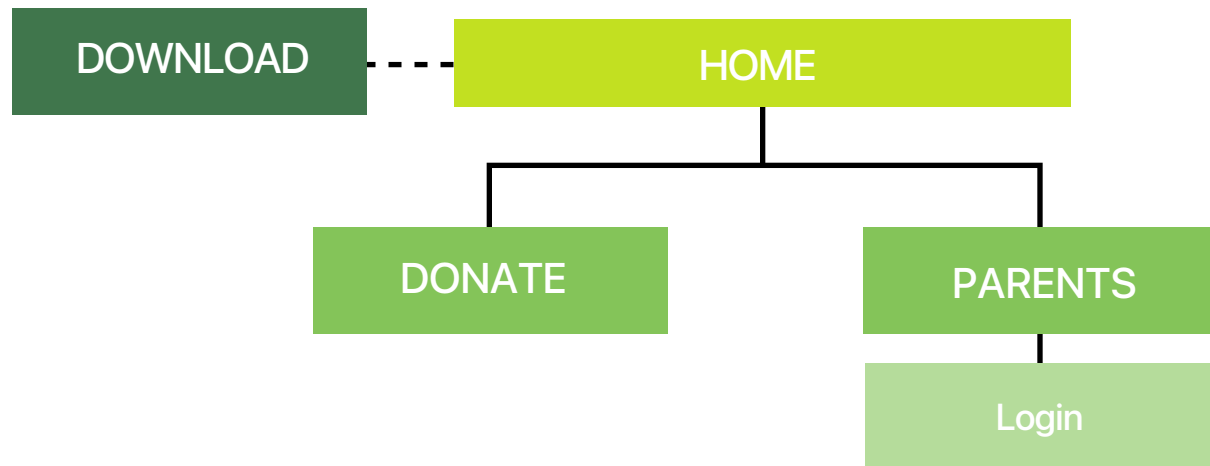
Office of
Sponsored
Research

t: 410.837.4057
f: 410.837.5249
www.ubalt.edu

February 27, 2020

Shana Koslowsky
University of Baltimore
1420 N. Charles Street
Baltimore, MD 21201

RE: **IRB Protocol #133– Approved under Full Board Review**

Dear Shana,

This letter serves as official confirmation of the Institutional Review Board's review and approval of your protocol for a study entitled "Thrive (Avatar App)".

The Institutional Review Board considered your protocol and based on your application concluded that, while there is potential risk of harm if individuals are unknowingly identified, you have sufficient safeguards and research protocols in place to mitigate that risk. The Institutional Review Board approved your proposal.

Approval of this protocol will expire on 2/26/2021, unless an application to continue the protocol is submitted to the IRB. It is your responsibility to assure that project activities are not conducted past the end date. **If you plan to continue your research, you must submit a renewal application in Kuali protocols six to eight weeks before the expiration date above.**

Investigators are responsible for reporting in writing to the IRB any changes to the human subject research study, procedures, or personnel. This includes changes to the research design or procedures that could introduce new or increased risks to human subjects and thereby change the nature of the research. In addition, you must report any adverse events or unanticipated problems to the IRB for review.

If you have any questions, please do not hesitate to contact me directly by phone or via email.

As authorized by Dr. Gabriela Wasileski
Chair, Institutional Review Board

Stefanie Hamberger
Coordinator, Institutional Review Board

Appendix D
IRB Documentation (CITI Testing)

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)
COMPLETION REPORT - PART 1 OF 2
COURSEWORK REQUIREMENTS*

* NOTE: Scores on this Requirements Report reflect quiz completions at the time all requirements for the course were met. See list below for details. See separate Transcript Report for more recent quiz scores, including those on optional (supplemental) course elements.

- **Name:** Shana Koslowsky (ID: 8872713)
- **Institution Affiliation:** University of Baltimore (ID: 4239)
- **Institution Email:** shana.shrader@ubalt.edu
- **Institution Unit:** Communication Design

- **Curriculum Group:** Human Subjects Research (HSR)
- **Course Learner Group:** Group 1: Student Researchers
- **Stage:** Stage 1 - Basic course

- **Record ID:** 35187458
- **Completion Date:** 01-Feb-2020
- **Expiration Date:** 31-Jan-2023
- **Minimum Passing:** 80
- **Reported Score*:** 82

REQUIRED AND ELECTIVE MODULES ONLY	DATE COMPLETED	SCORE
History and Ethical Principles - SBE (ID: 490)	01-Feb-2020	4/5 (80%)
Defining Research with Human Subjects - SBE (ID: 491)	01-Feb-2020	4/5 (80%)
The Federal Regulations - SBE (ID: 502)	01-Feb-2020	4/5 (80%)
Assessing Risk - SBE (ID: 503)	01-Feb-2020	5/5 (100%)
Informed Consent - SBE (ID: 504)	01-Feb-2020	5/5 (100%)
Privacy and Confidentiality - SBE (ID: 505)	01-Feb-2020	5/5 (100%)
Students in Research (ID: 1321)	01-Feb-2020	4/5 (80%)
Unanticipated Problems and Reporting Requirements in Social and Behavioral Research (ID: 14928)	01-Feb-2020	4/5 (80%)
Consent in the 21st Century (ID: 17060)	01-Feb-2020	4/5 (80%)
FERPA for Researchers (ID: 17410)	01-Feb-2020	2/5 (40%)

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid Independent Learner.

Verify at: www.citiprogram.org/verify/?ka0ccc70a-b1ef-4968-a544-928a8b275eba-35187458

Collaborative Institutional Training Initiative (CITI Program)
Email: support@citiprogram.org
Phone: 888-529-5929
Web: https://www.citiprogram.org

Completion Date 01-Feb-2020
Expiration Date 31-Jan-2023
Record ID 35187458

This is to certify that:

Shana Koslowsky

Has completed the following CITI Program course:

Human Subjects Research (HSR) (Curriculum Group)
Group 1: Student Researchers (Course Learner Group)
1 - Basic course (Stage)

Under requirements set by:

University of Baltimore

Verify at www.citiprogram.org/verify/?wf736313a-7fce-416c-8d59-4c4220e0eac3-35187458

CITI
Collaborative Institutional Training Initiative

Whom to Contact about this study:

Principal Investigator: Shana Koslowsky
Department: College of Liberal Arts
Telephone number: 443-864-0146

CONSENT FORM FOR PARTICIPATION IN RESEARCH ACTIVITIES
Thrive (Avatar App)

I.   **INTRODUCTION/PURPOSE:**
I am being asked to participate in a research study. The purpose of this study is to learn more about how a child can identify themselves (if at all) in an avatar of a mobile application, and which features are essential to achieving that. I am being asked to volunteer because I am a parent or guardian of a child in the 3-8 age range). My involvement in this study will begin when I agree to participate and will continue until October 15th, 2020. About 15 persons will be invited to participate.

II.   **PROCEDURES:**
As a participant in this study, I will be observe as my child is recorded (video and audio) and asked to build themselves or another person from a picture as a digital avatar. My participation in this study will last for about 10 minutes.

III. **RISKS AND BENEFITS:**
My participation in this study does not involve any significant risks and I have been informed that my participation in this research will not benefit me personally, but these results could effect a child's user experience with mobile applications and potentially help them understand content better.

IV.   **CONFIDENTIALITY:**
Any information learned and collected from this study in which I might be identified will remain confidential and will be disclosed ONLY if I give permission. All information collected in this study will be stored on an external hard drive in a locked file cabinet in a locked room. Once this project is complete, all video data collected will be destroyed. If information learned from this study is published, I will not be identified by name. By signing this form, however, I allow the research study investigator to make my records available to the University of Baltimore Institutional Review Board (IRB) and regulatory agencies as required to do so by law.

Consenting to participate in this research also indicates my agreement that all information collected from me individually may be used by current and future researchers in such a fashion that my personal identity will be protected. Such use will include sharing anonymous information with other researchers for checking the accuracy of study findings and for future approved research that has the potential for improving human knowledge.

This research study is for a master's thesis.

V.   CONTACTS AND QUESTIONS:
The principal investigator(s), Shana Koslowsky. As well as, Meghan Rhee and Greg Walsh has offered to and has answered any and all questions regarding my participation in this research study. If I have any further questions, I can contact Shana Koslowsky at 443-864-0146 or shanakoslowsky@gmail.com.

For questions about rights as a participant in this research study, contact the UB IRB Coordinator: 410-837-6199, irb@ubalt.edu.

VI.   VOLUNTARY PARTICIPATION
I have been informed that my participation in this research study is voluntary and that I am free to withdraw or discontinue participation at any time.

I will be given a copy of this consent form to keep.

VII.   SIGNATURE FOR CONSENT
The above-named investigator has answered my questions and I agree to be a research participant in this study. By signing this consent form, I am acknowledging that I am at least 18 years of age.

I am consenting to being video and audio recorded during this testing.   Yes_____   No_____

Participant's Name: _____   Date: _____

Participant's Signature: _____   Date: _____

Investigator's Signature: _____   Date: _____

SIGNATURE FOR CONSENT
The above-named investigator has answered my questions and I agree to allow my child/ person under my guardianship to be a research participant in this study.

Minor Participant's Name: _____   Date: _____

Parent/Legal Guardian's Signature: _____   Date: _____

Investigator's Signature: _____   Date: _____

(Sign Up/Login)

Sign Up with Email

Already have an account? Log In here.

Grown ups, what is your Email address?

Create a password

What is your childs first name?

(Avatar Build)

What is _____ age?

2   3   4   5   6   7+

_____ is a...

GIRL   BOY

HAIR COLOR

SKIN TONE

FACE SHAPE

SMILE

SHIRT COLOR

THRIVE

AWESOME!

(Milestone Stories)

Milestones

Paige

CIRCLES AND SQUARES

Appendix E
Digital Wireframe

(Parents)

Paige

Sloane

FOR PARENTS

ACCOUNT: Parent@email.com

USERS:
(Change your avatar)

Paige

Sloane

ABOUT:

About the app and lots of helpful things to help parents understand what the app is supposed to be used for and other resources to look at that are helpful for parents...

(Games)

Paige

ABC

123
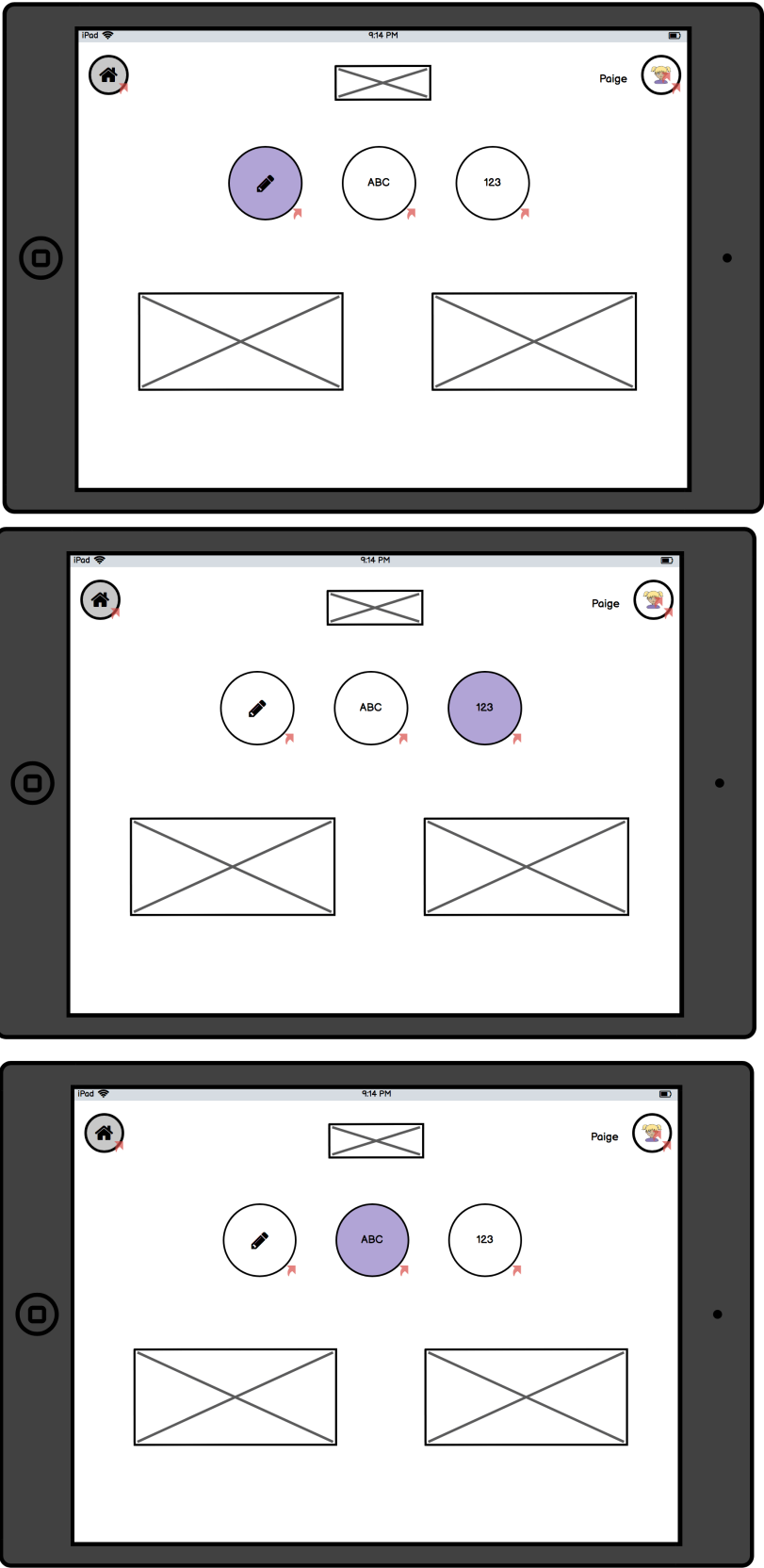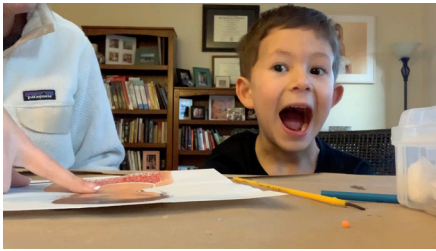
Participants:

Participant 1 Paper Protoype:

EYE COLOR

FACE SHAPE

HAIR COLOR
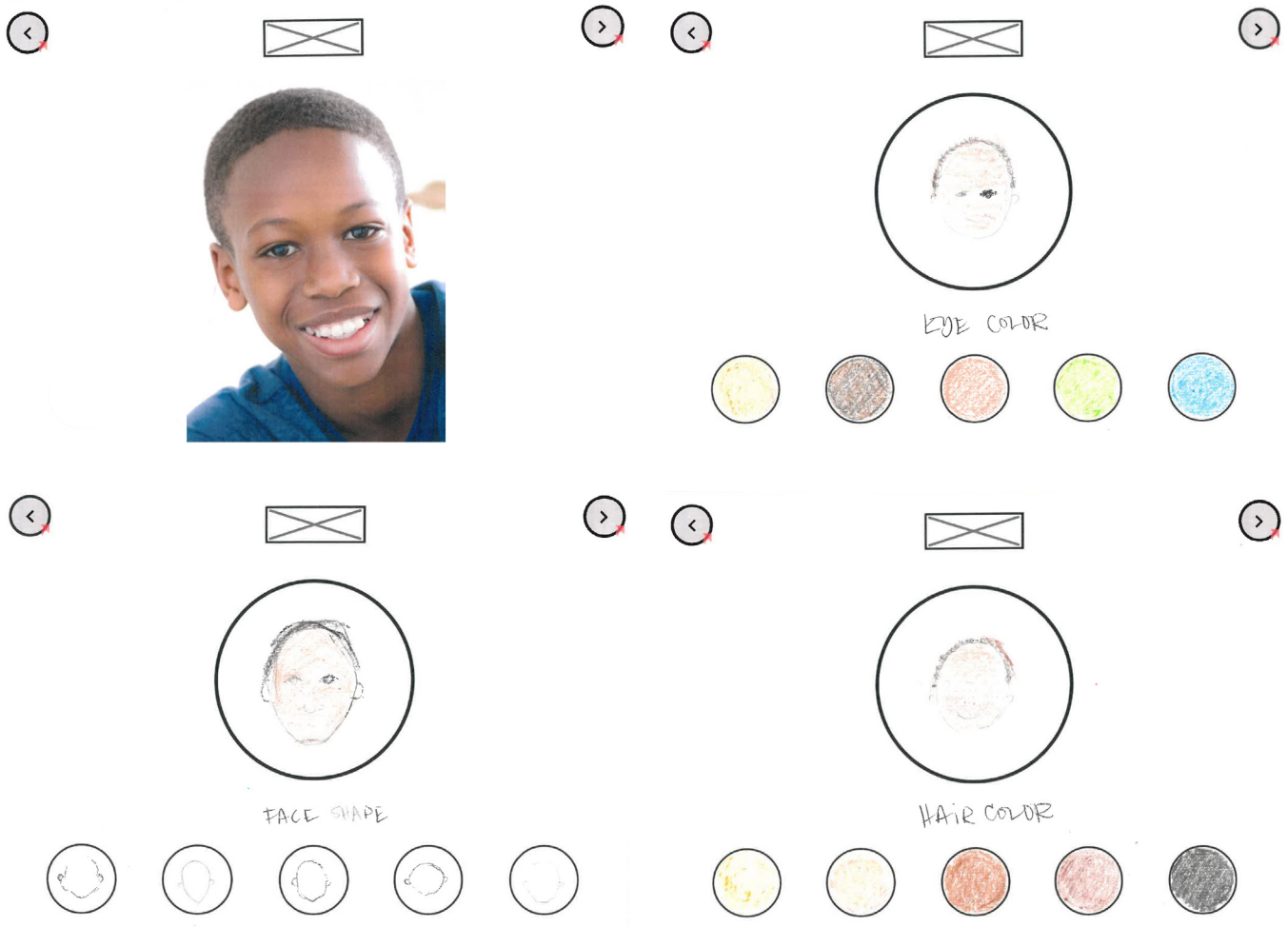
HAIRSTYLE

NOSE

SHIRT COLOR

SKIN TONE

SMILE

AWESOME!

Participant 2 Paper Protoype:

EARS

EYE BROWS

EYE COLOR

FACE SHAPE

HAIR COLOR

HAIR STYLE

NOSE

⭐

SHIRT COLOR

SKIN TONE

SMILE
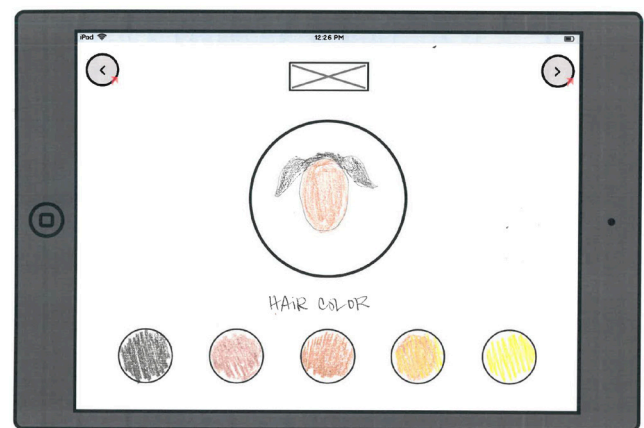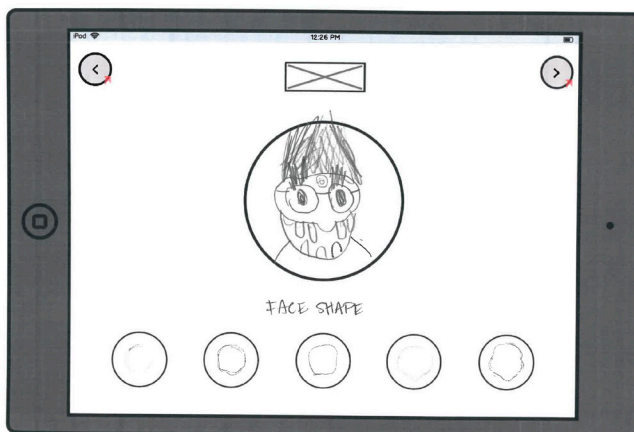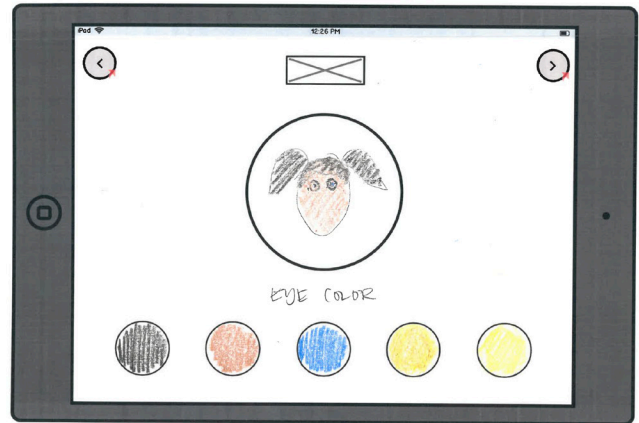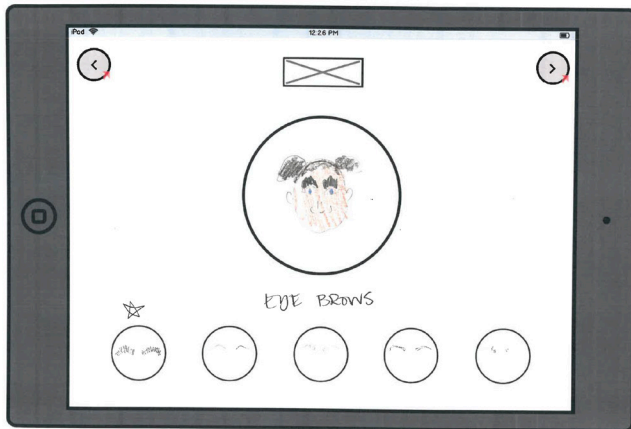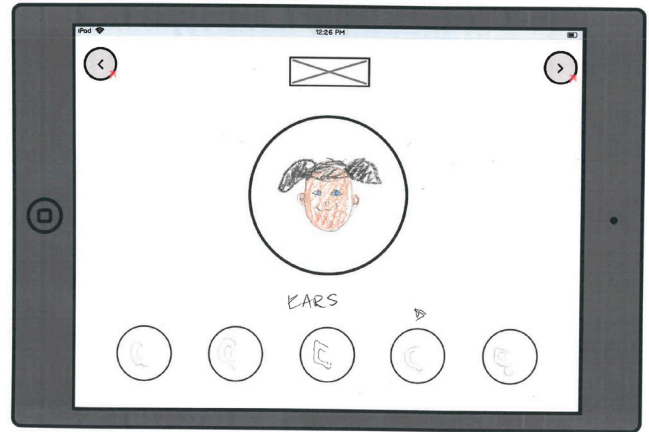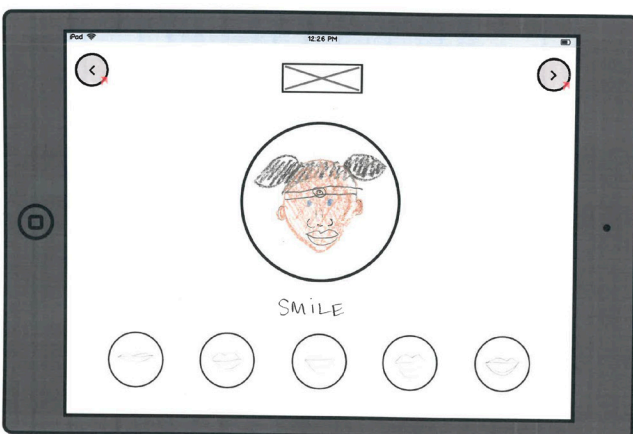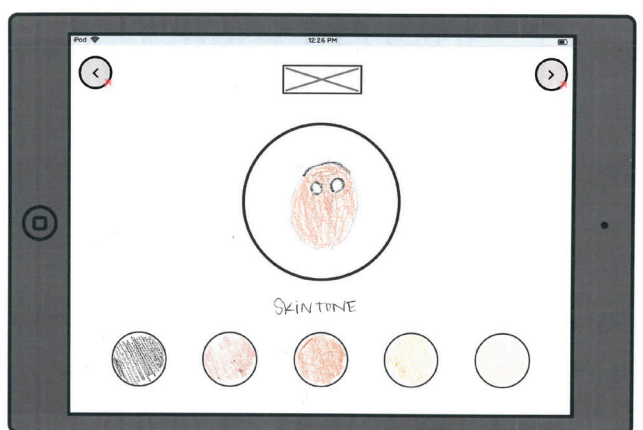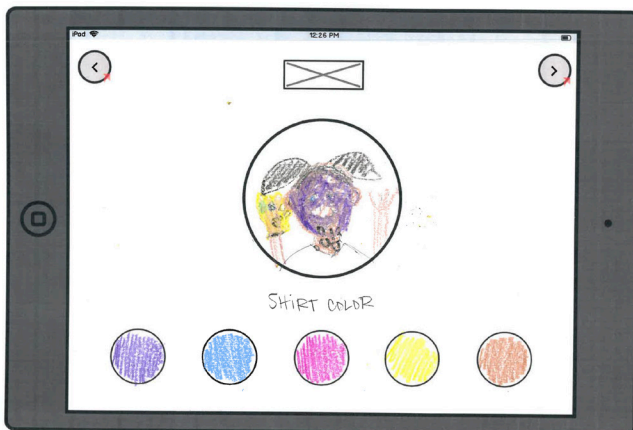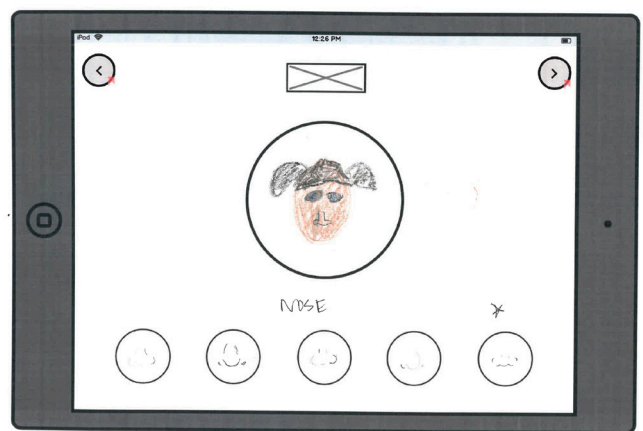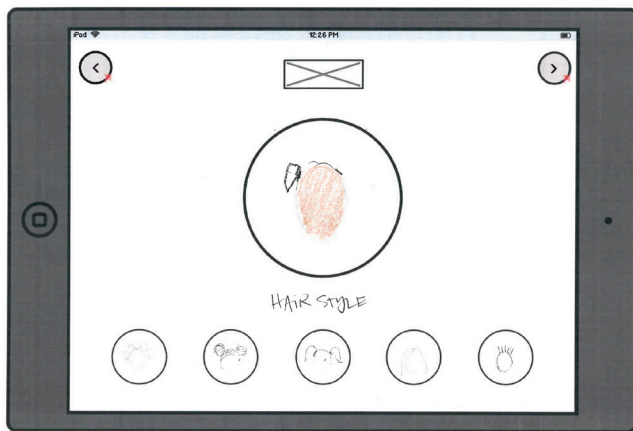
Participant 3 Paper Protoype:

JULIE

EYE COLOR

FACE SHAPE

HAIRCOLOR

HAIRSTYLE

NOSE

SHIRT COLOR

SHIRT COLOR

SKIN TONE

SMILE
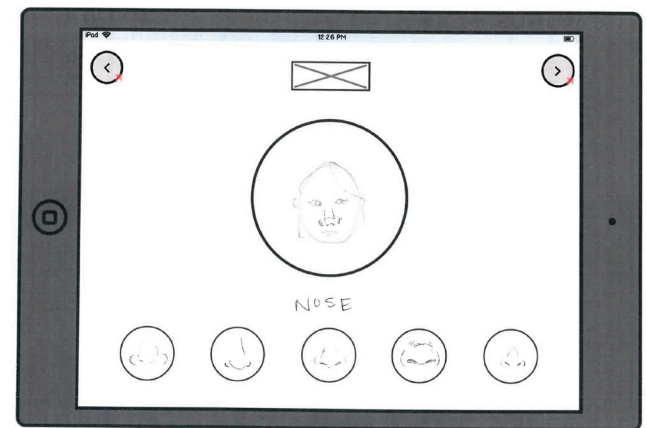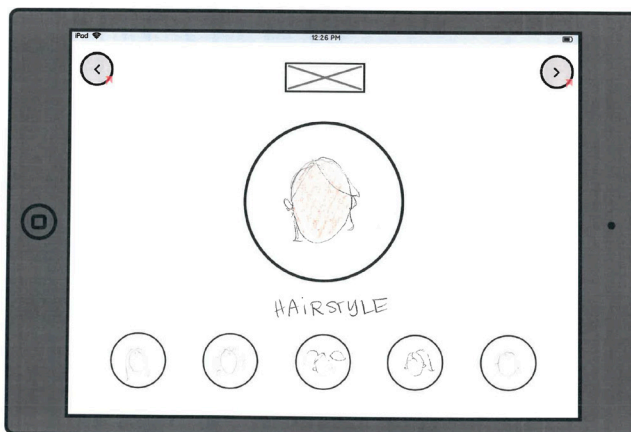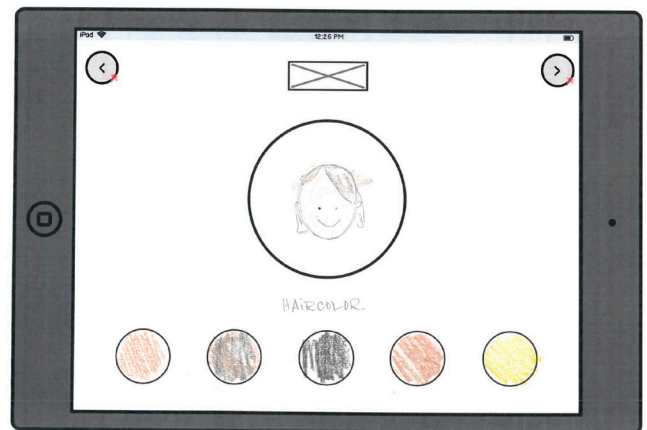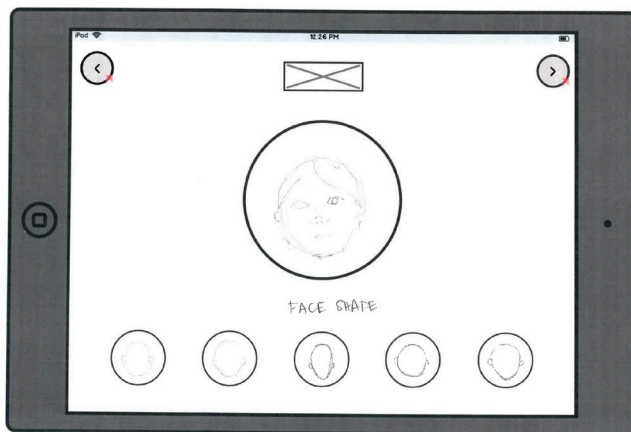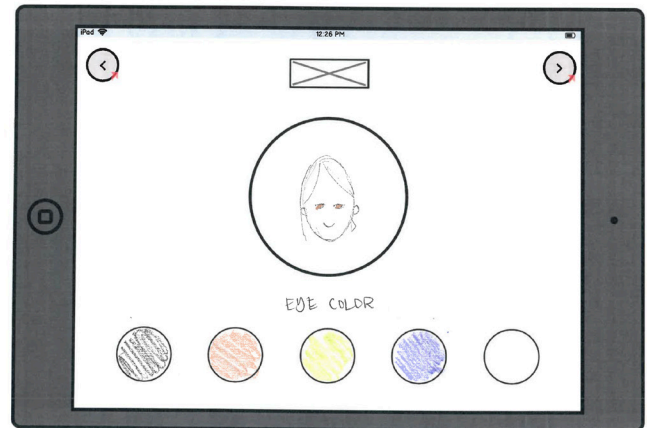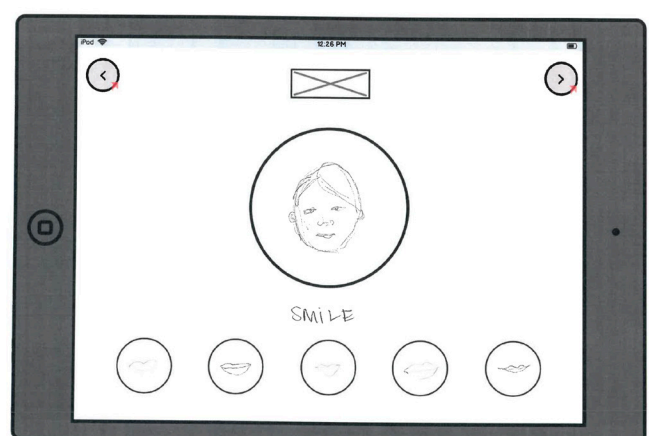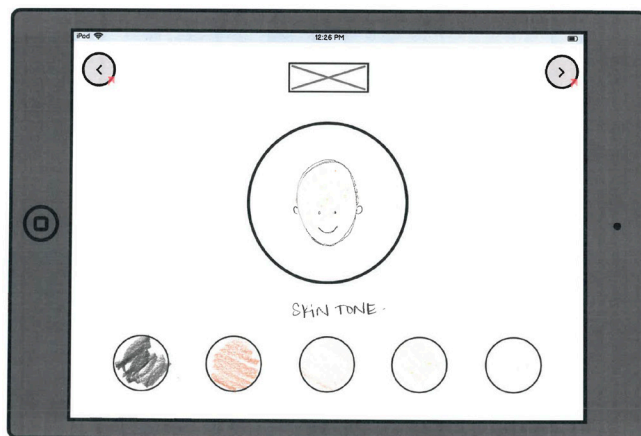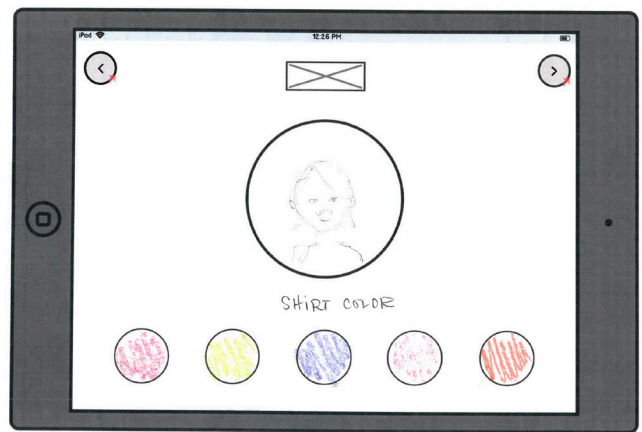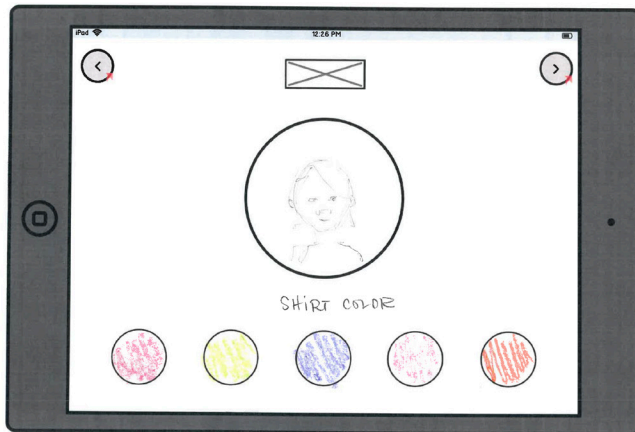
For complete avatar build utilized for testing visit:
http://thrive-avatar-ux.herokuapp.com/
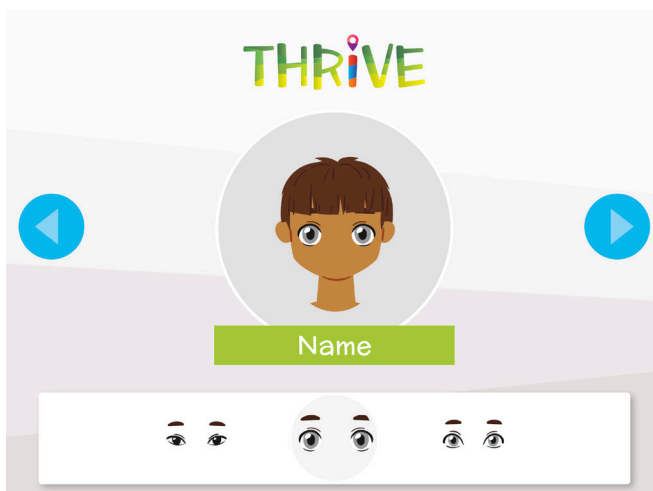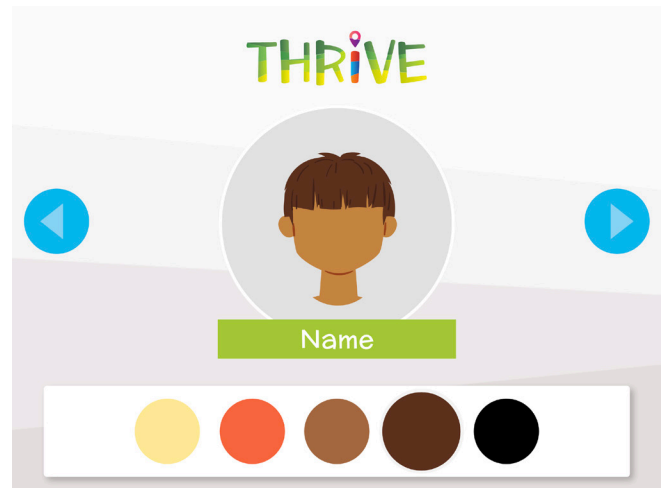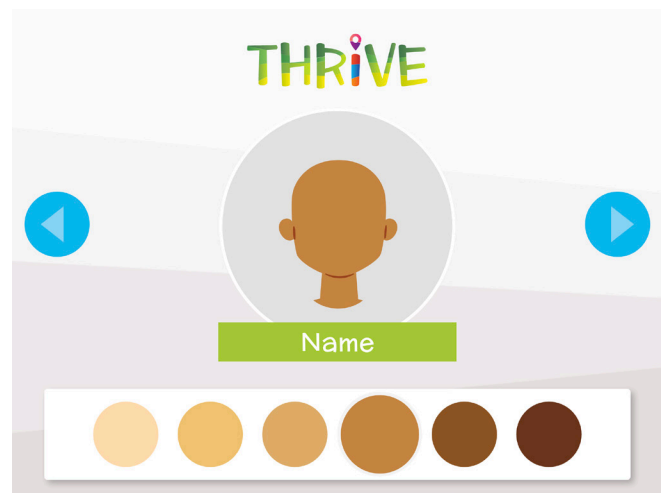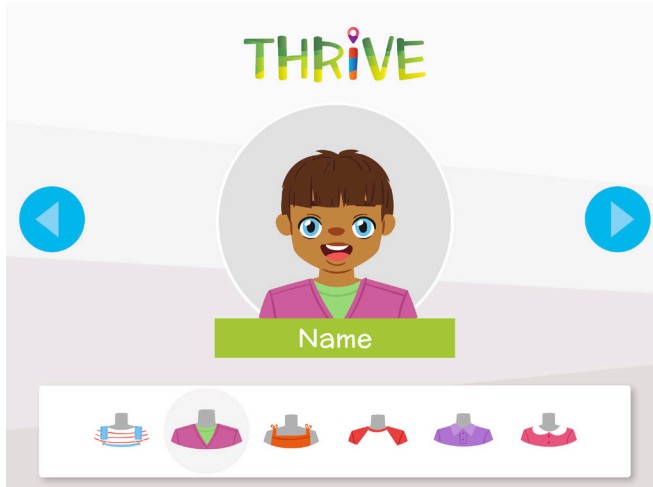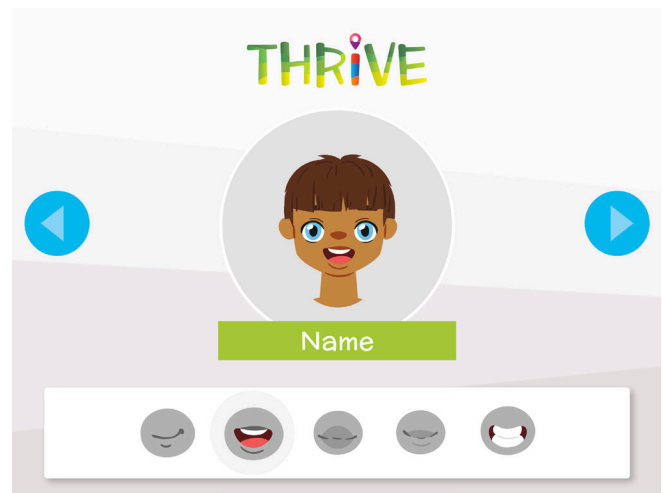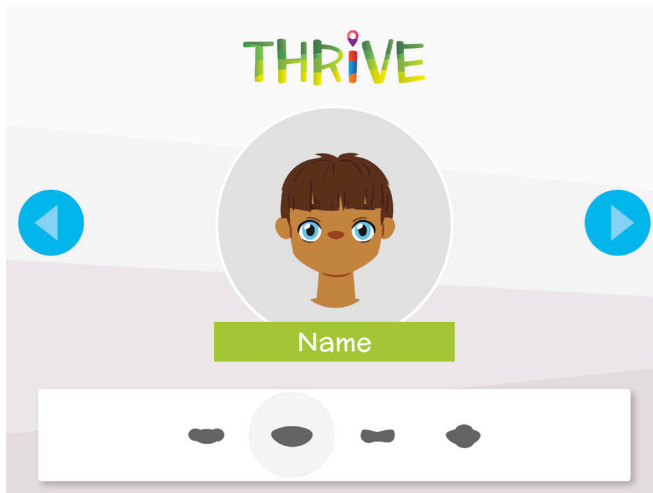
Participants and their avatars:
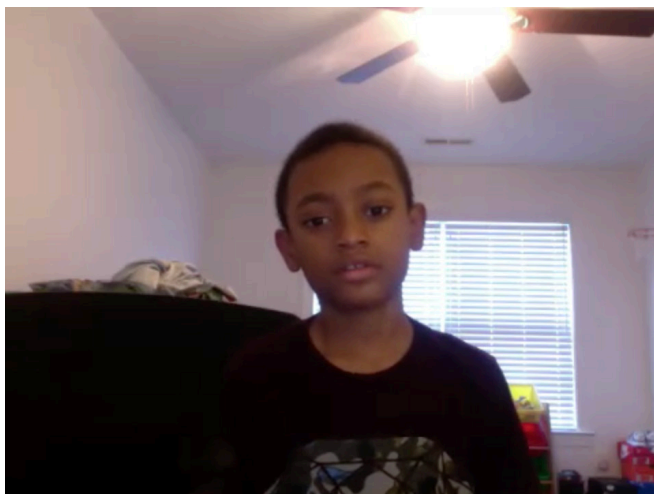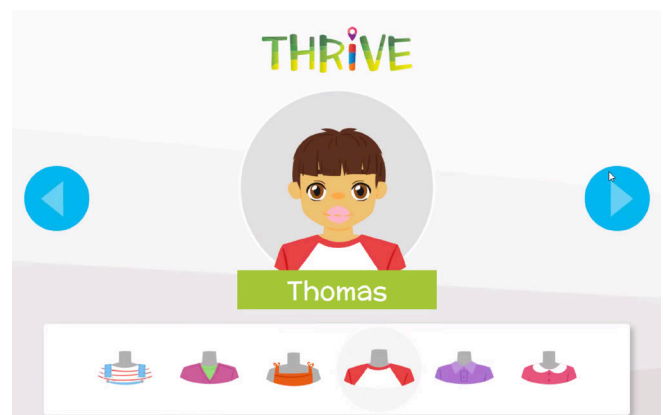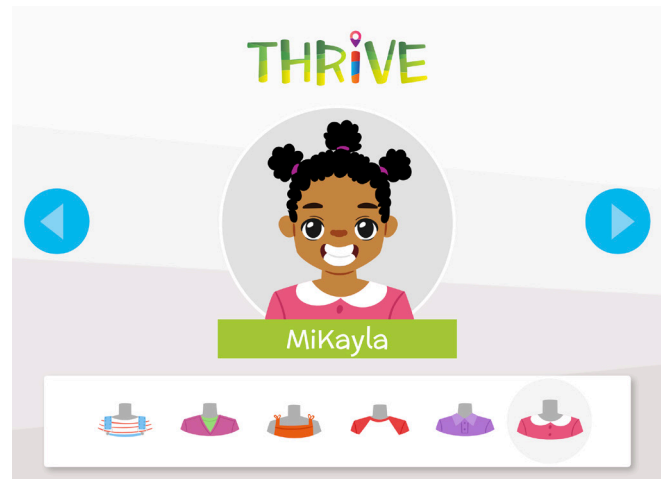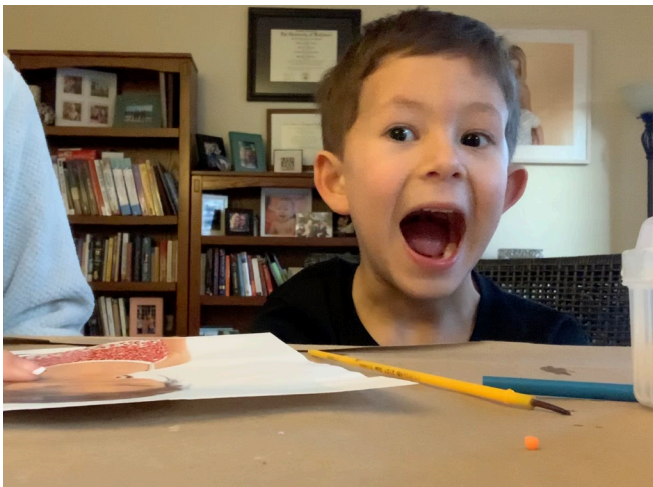
Appendix I
Style Guide

BRAND COLORS
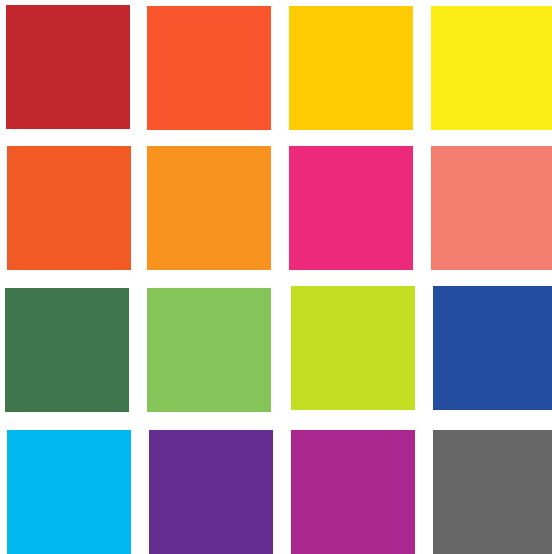
TYPOGRAPHY

This is a TITLE and the font used for stories.

This is body copy or secondary font.

Title Font and Main Font for Application

McLaren

Body Font and Secondary Title Font

Source Sans Bold
Source Sans Italic

ICONS

BUTTON STYLES

Button Text

→ + 1
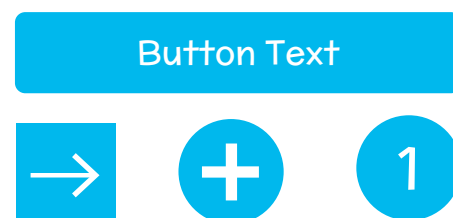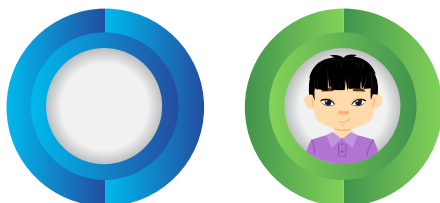
A

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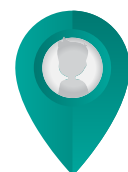
THRIVE

Appendix K
Final Logo

A MILESTONE APPLICATION

THRIVE   THRIVE   THRIVE

Appendix L
Avatar Build Prototype (Continued)
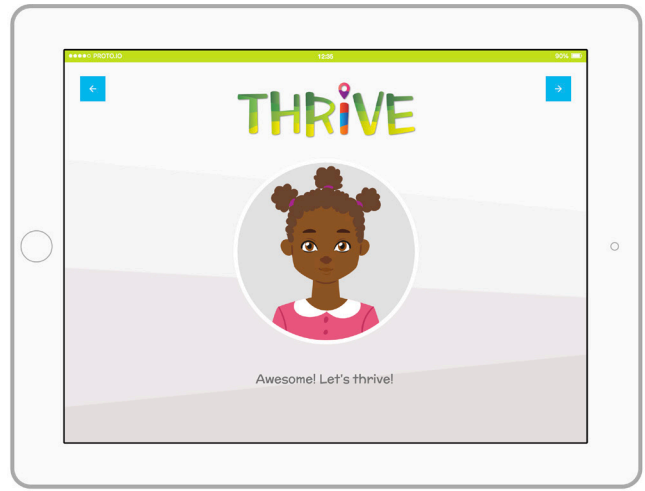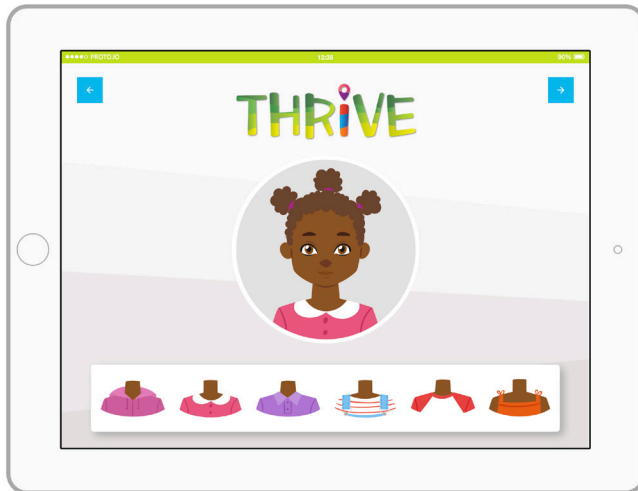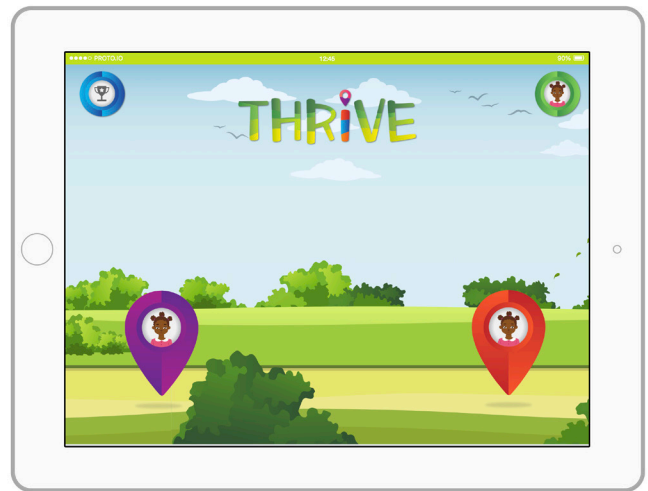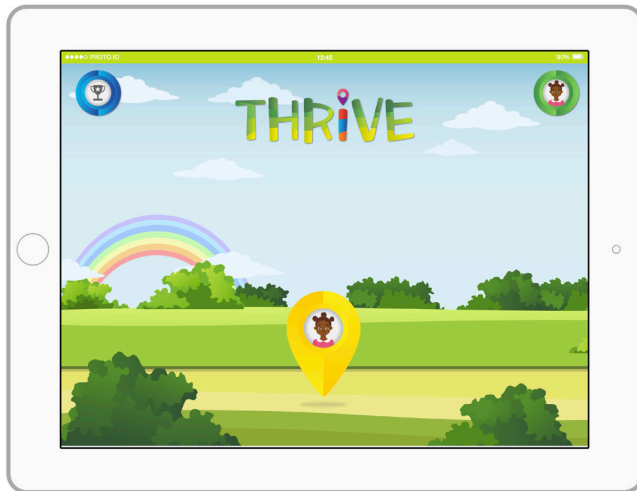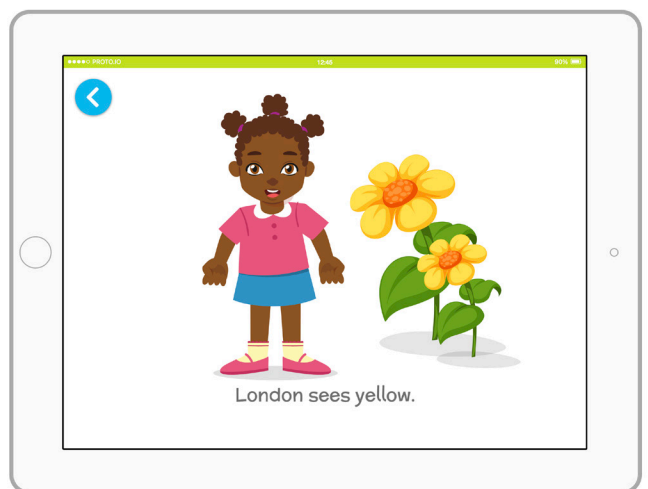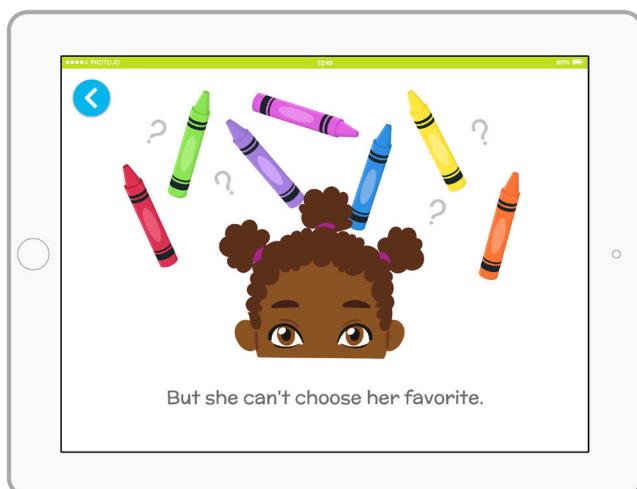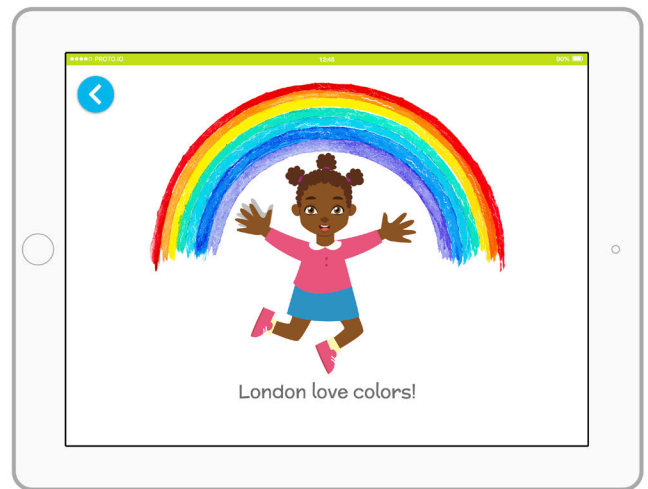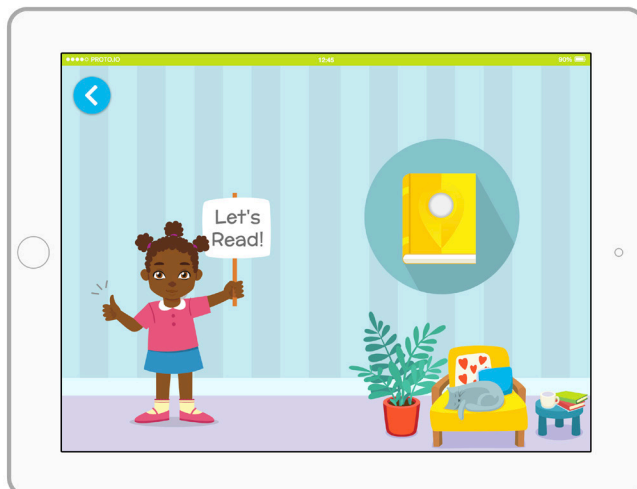
Story Start:

Let's Read!

London love colors!

But she can't choose her favorite.

London sees yellow.

It's raining yellow bananas. Oh my!

London sees green.

She sits in the grass. Next to a tall green tree.

London sees blue.

She swims in the big blue ocean!

London sees orange.

She loves feeling the bright orange sun.

London sees red.

She loves pretty red hearts!

Testing Screen:

So many colors! Can you name them?

Great job! What is your favorite color?

The end.

Avatar Closet:

Games:

Parents:

Donate THRIVE Parents 🔍

Avatar play at its best!

Build an avatar for your child and watch them interact with ebooks about important milestones for their age range.

Donate THRIVE Parents 🔍

Imagination Central

Reading, language, math and creative skills for imaginations of all ages.

Adaptive learning path

Thrive is designed to grow with your child and the ever adapting to the markers they need to be hitting.
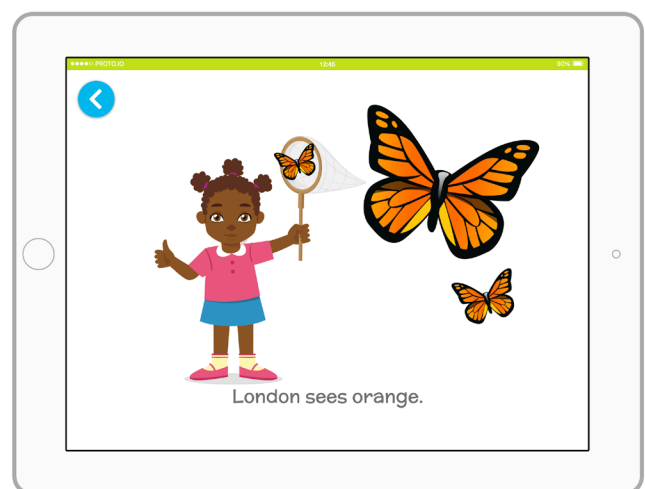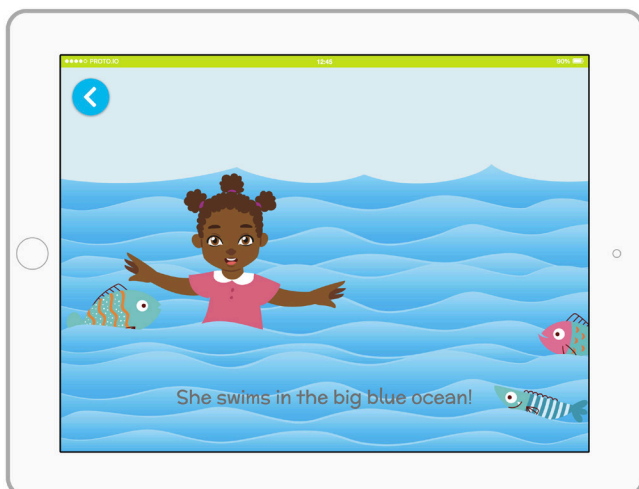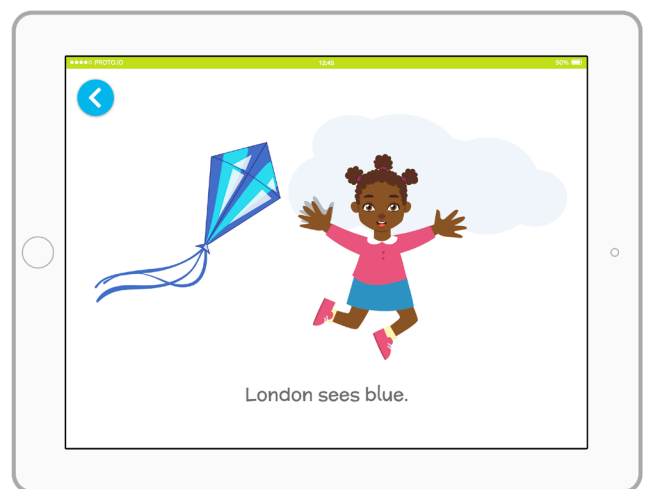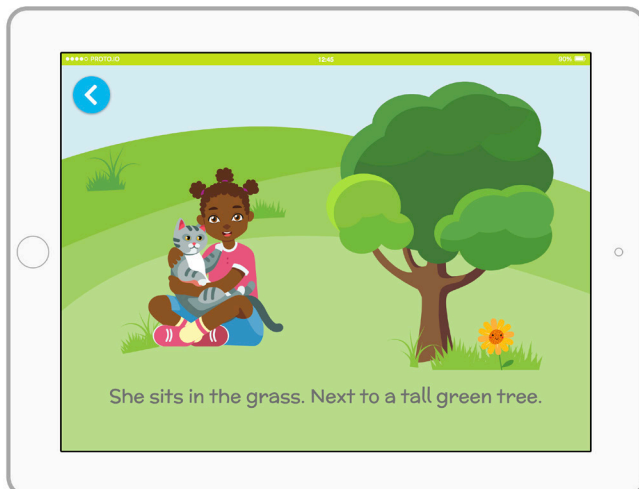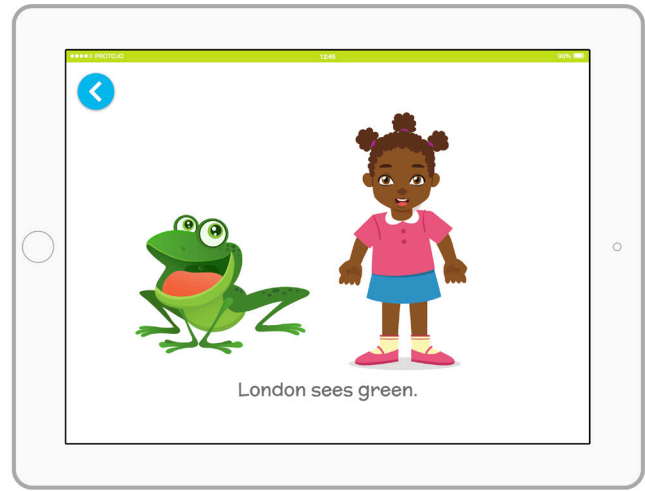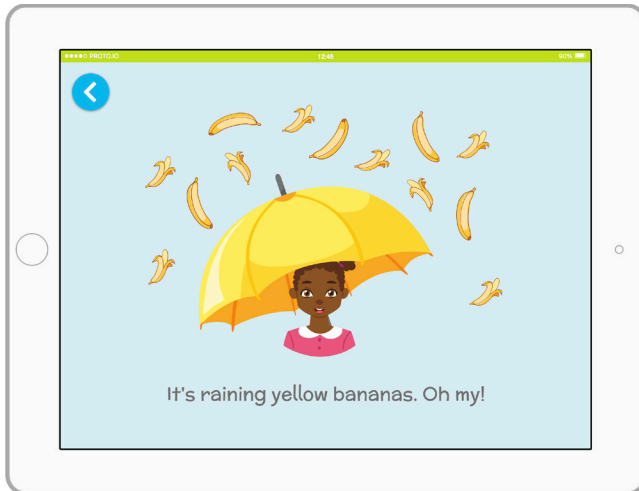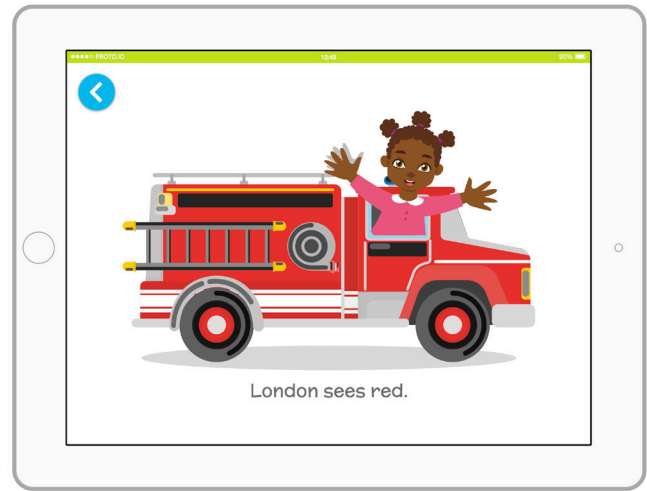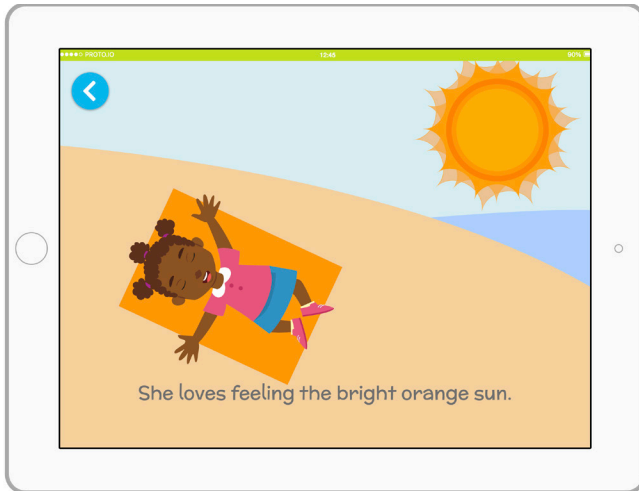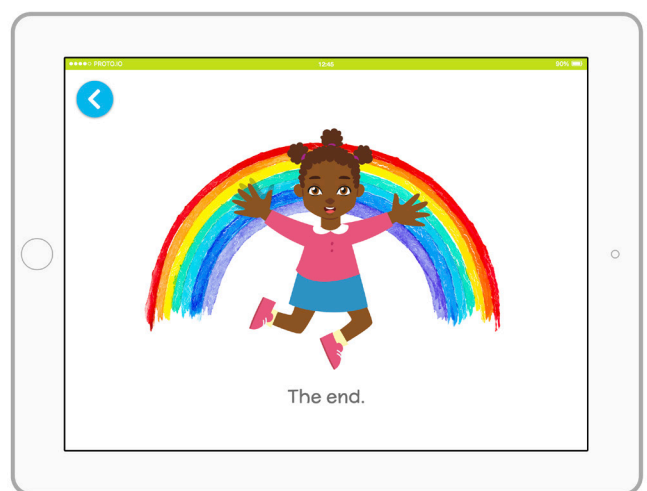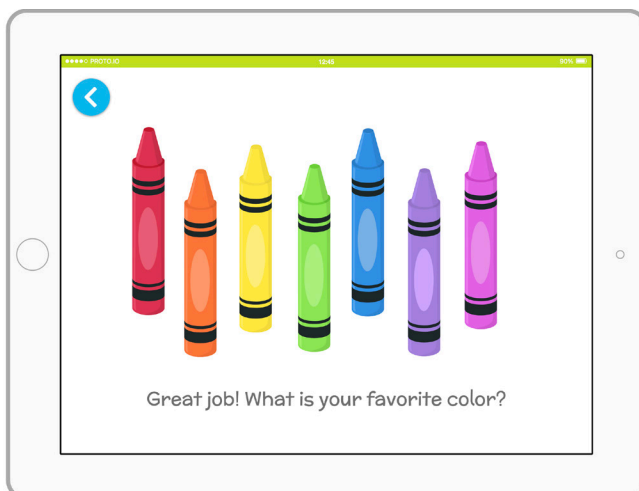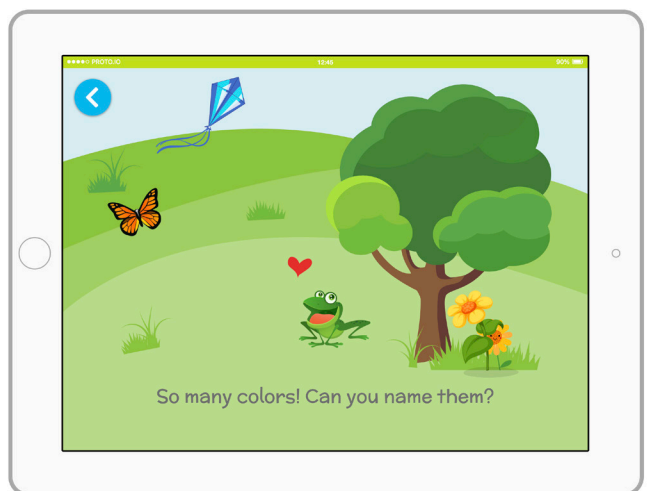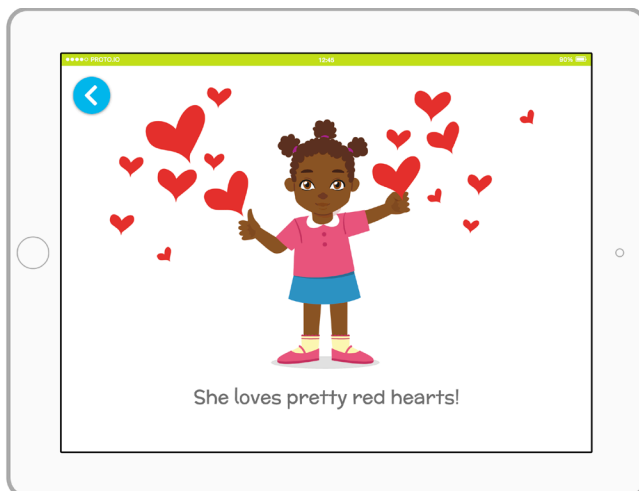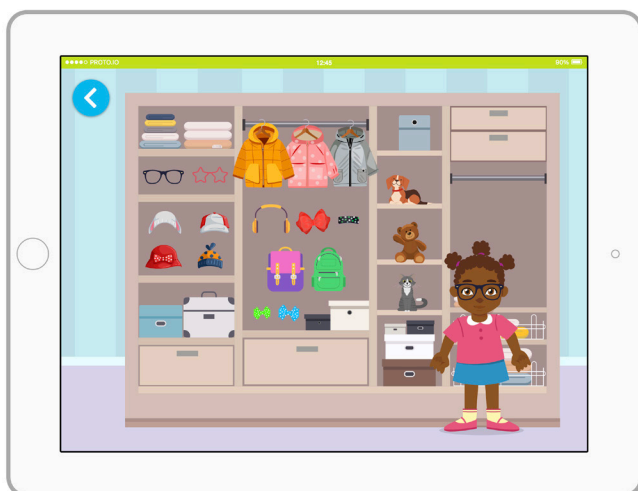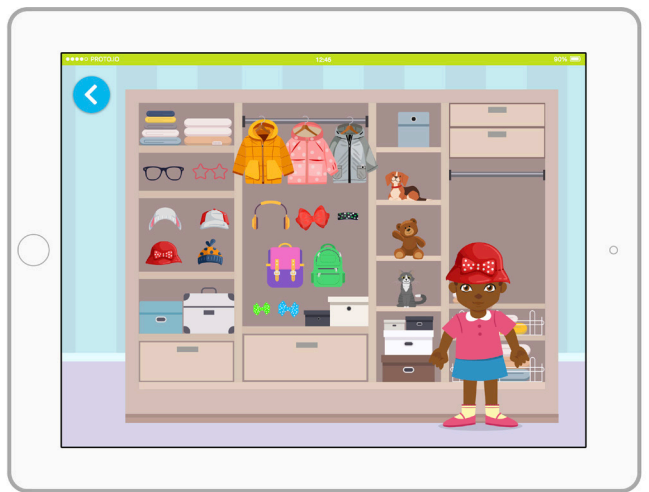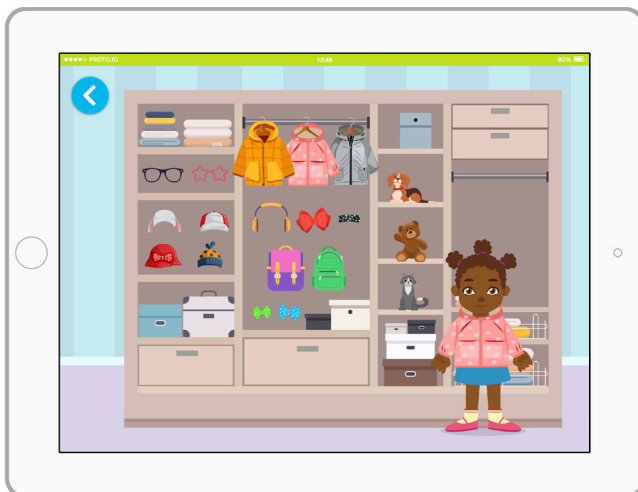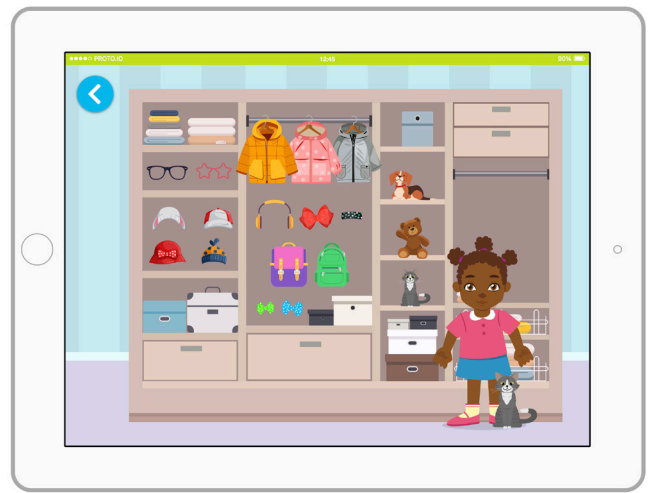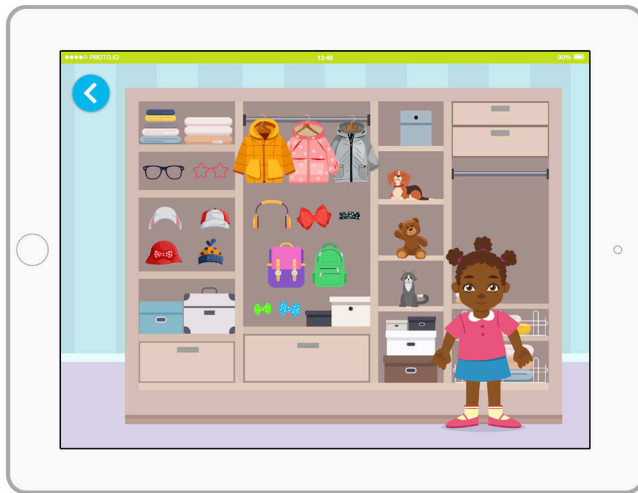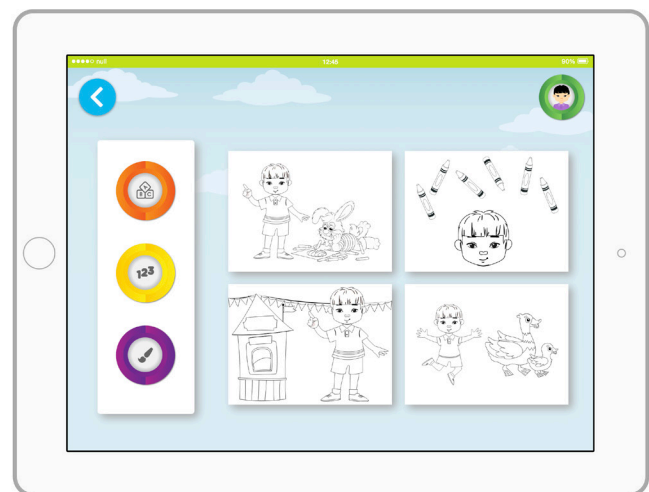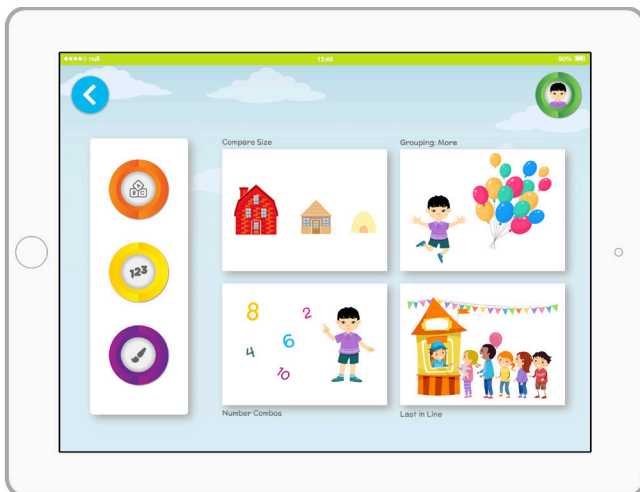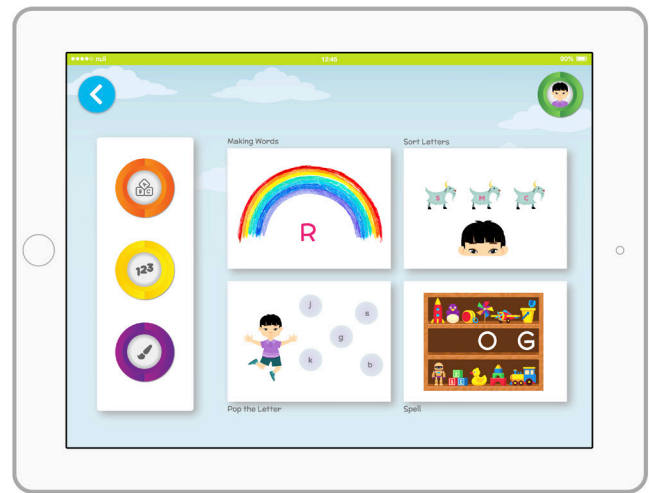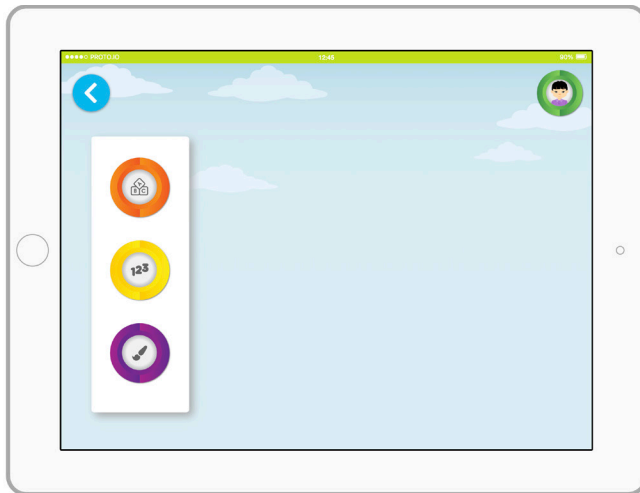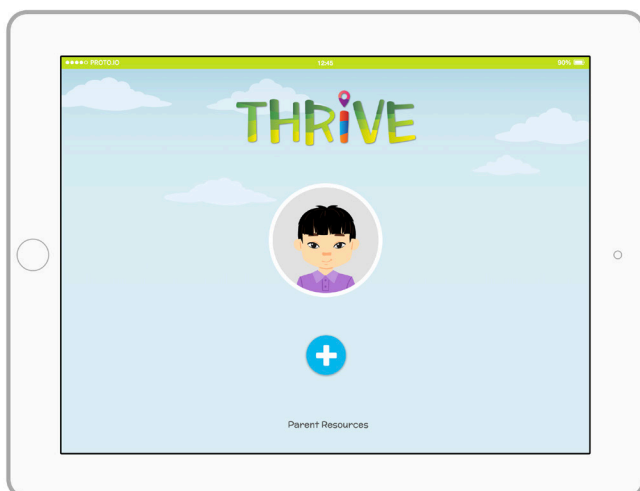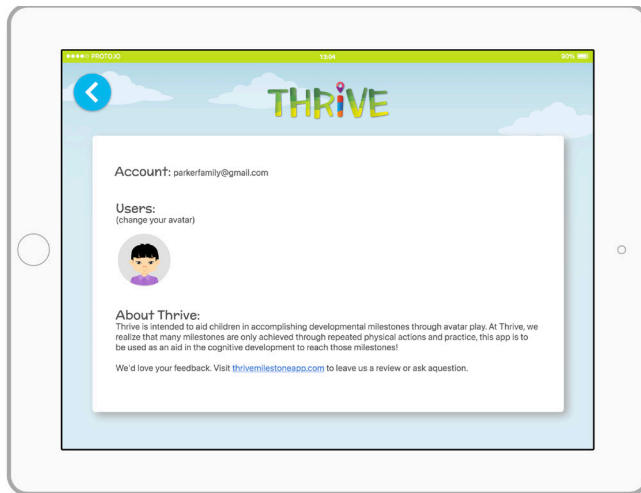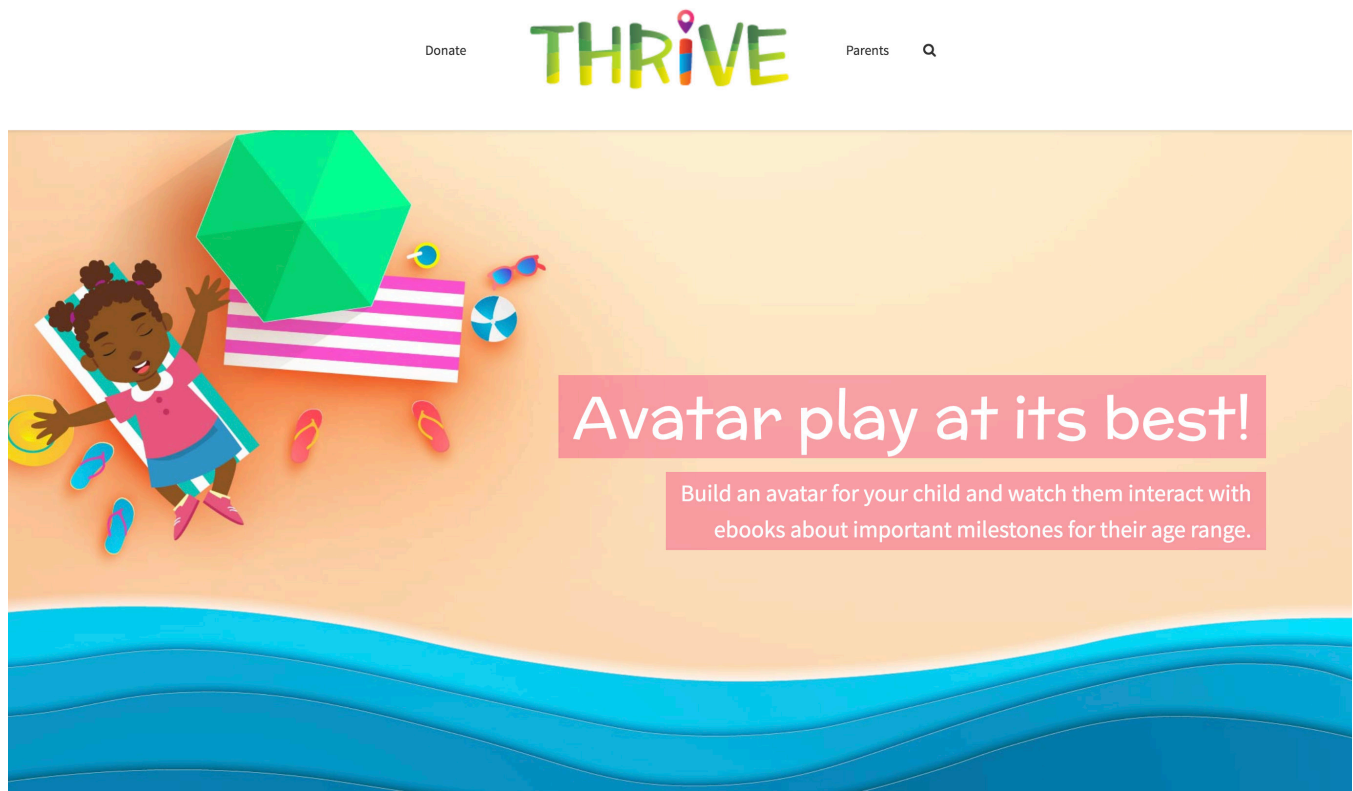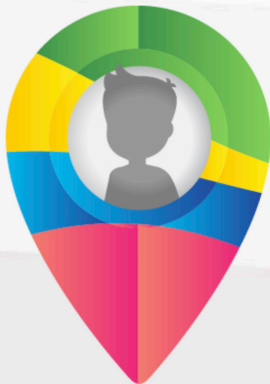
Thriving with Avatar Play

Avatars have a unique way of promoting a personal experience and connection with digital content. Research shows that individuals are more motivated and determined to complete a challenge if they create an avatar that resembles themselves. This is because your child makes a personal and emotional reference to the avatar and wants the avatar to succeed just as they would want themselves to in real life. Thrive is the perfect marriage of technology literacy and identity development.

Download on the App Store

Milestone Development

London sees red.
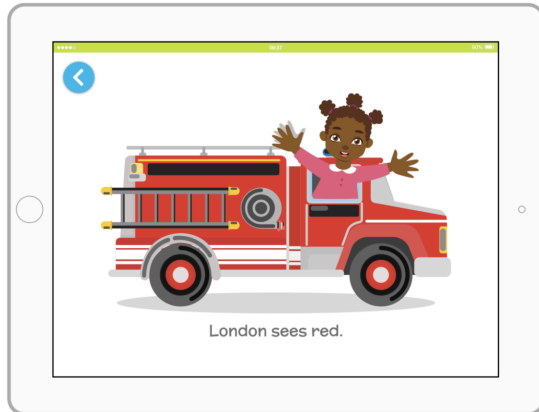
As technology and media play a bigger role in our lives, parents have a responsibility to make sure that presence is effective and positive. Finding a successful means to teach, engage and bond is Thrive's main goal. Work on age appropriate milestones while gaining technology literacy.

Independent Learning

Kids can learn independently with Thrive. With games and activities catered towards their specific age range, children are encourage to learn and play on their own. Choose to play with your child or feel good about leaving them to play unaided.

Parents love us!

★★★★★

Thrive has been a lifesaver for my 5 year old. She loves reading and watching her self complete milestones!

Mary G. , Bel Air, MD

If you are looking for an educational app for your 2-5 yr old, Thrive seriously most research-based, engaging, non-annoying app.
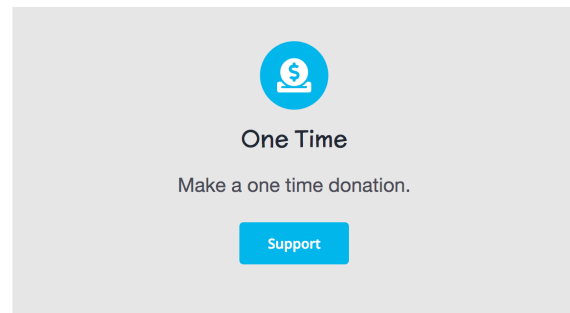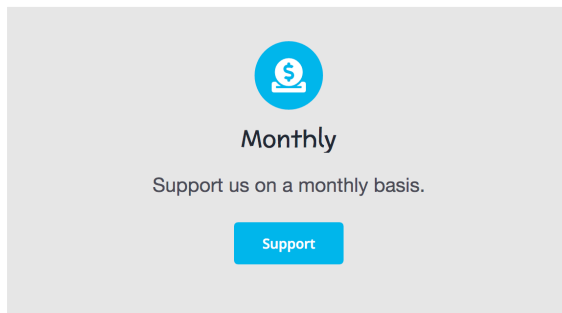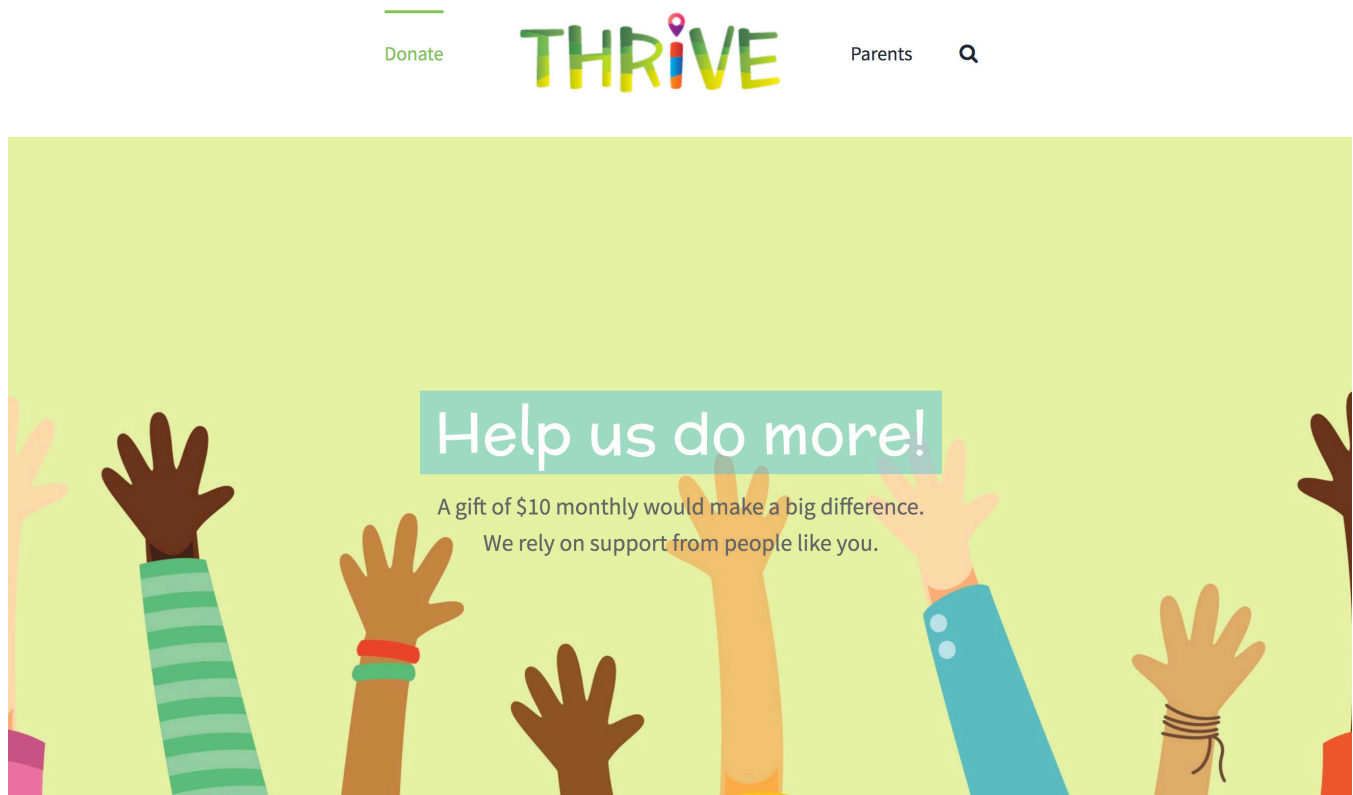
Kevin C., Weston, CT

My kid loves Thrive! The combo of school facts along with social/emotional content is outstanding.

Casey S., Bakersfield, CA

THRIVE
A MILESTONE APPLICATION

Donate THRiVE Parents 🔍

Help us do more!

A gift of $10 monthly would make a big difference.
We rely on support from people like you.

Monthly

Support us on a monthly basis.

Support

### One Time

Make a one time donation.

Support

Give the gift of life-changing education!

Help us hit OUR milestones! We need your help to produce the best in educational and personalized fun content for your kids. With the COVID-19 creating mass school closings, demand for Thrive has has become more important than ever. We appreciate your support and donations during this trying time.

THRIVE

Donate   Parents   🔍

Login Anywhere!

Handle your account from a desktop or iPad.
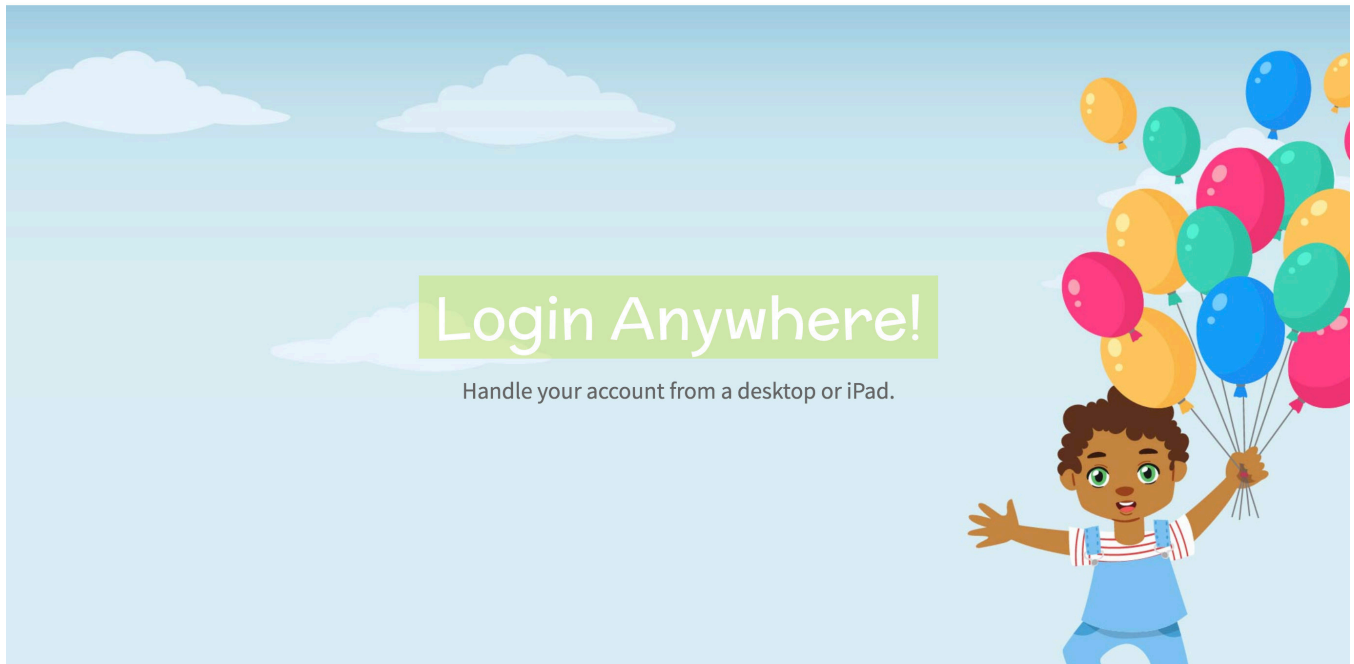
Sign in to your account...

- Edit your account
- Donate
- Learn more about Thrive

Username

Password

Submit