LOOP

GARRICK LI CAPSTONE SUMMER 2015

Contents

The People Behind Loop

Our Team

AARON BRAKO

A thinker, designer and builder, Aaron brings an engineering perspective and creative problem solving approach to create products and digital experiences. He holds a Bachelor's degree in Information Technology Engineering from the University of Mumbai. He spent the last year and a half running his own design agency, which specialized in responsive web interfaces. He joined the MHCI+D program to better understand the UX design process. Persistence, curiosity and an obsessive attention to detail define him. He is passionate about the latest trends in technology particularly those related to interaction design, augmented reality and the Internet of things.

GARRICK LI

Garrick holds a Bachelor's degree in Music from the University of Washington with master's level coursework in Music Technology from New York University. He has worked in multiple industries which include media production and Internet technologies. This insight into multiple real-world industries gives him a unique perspective of the user experience. He is interested in blending creative ideologies with his technical skills, which has led him into this exploration of interaction, interface, and research design. He is interested in augmented reality, interaction design, and visual/audio installations

LAUREN RAKUSIN

Lauren holds a Bachelor's degree in Cognitive Science from the University of Southern California and has experience researching the neuroscience of emotion under Damasio's lead at the Brain and Creativity Institute in LA. Enthusiastic about new ways of experimentation and exploration, she thrives in creative and collaborative environments, and her greatest passions lie at the intersection of art, people, and technology. She is a free thinker and creative problem solver who tries to bring a little magic into everything that she does.

RANJ KRISHNAN

Ranj has a business degree, amongst other work, with extensive experience in the banking and financial services industry. She is interested in the UX process from research to design. Her skills include project management and strategic work development. Trying to understand projects from the users' perspective is the driving force in her life and is developing skills in interaction design and the design process itself. She enjoys the intricate complexities of the UX design process especially in the areas of emerging technologies, healthcare, banking and ubiquitous computing.

Our Sponsor

INTENTIONAL FUTURES

JEREMY BEASLEY

Jeremy has a “focus cave.” You can tell he’s there when he’s burning holes in his computer screen and not blinking. It may have been in this very focus cave that as a child, Jeremy dreamed of being Jackie Chan and Jet Li. Since that fateful day, Jeremy honed his martial arts at Apple, Google and Microsoft before busting down the doors at iF where he takes on legions of prototyping problems and design strategy conundrums.

MICHAEL DIEDERICH

For Michael, rowing is addictive. It’s about figuring out the one thing you aren’t doing right and fixing it – then figuring out the next thing you aren’t doing right. Iterative feedback has always driven his work too. Whether it’s the year and a half he spent studying shampoo lather at Procter & Gamble, or his time uncovering consumer insights for Microsoft Windows, for Michael it’s about getting closer and closer to the core truth.

GREG MARTINEZ

Garland, Texas hit a record high of 111 °F in 2000. But by then, Greg had long since left for cooler things to do. In the late 90’s he managed logistics for The Carter Center’s election observation missions overseas. In the early 2000’s he was helping develop the Xbox 360 controller for Microsoft. He is a master of details and proponent of process. Greg might have made a good secret agent except for the fact that he talks to himself while he works.

Project Briefing

Executive Summary

DIY (do-it-yourself) practices and the maker movement have emerged and gained traction in recent memory. The rise of this culture is attributed the greater demand for personalized and customized materials and objects, a space that has been utilized by Etsy, Amazon Handmade, and others.

As new types of DIY projects arise in this community (electronics, 3D printing, robotics, etc.), there is a greater need for effectively crafted tutorials and learning systems. Our goal was to isolate a specific DIY space as a use case, and perform a series of user-centered design methods in order to find the most compelling solution to a problem within the learning of hands-on skills.

We found that there is an opportunity to understand how current DIY skills are taught, both locally and remotely, and to exercise both immediate and emerging technologies in order to increase the efficacy of teaching and learning these skills.

Our group strived to not only design a solution that could be applicable with the use of current technology, but also to look into the not-so-distant future and see how developing technologies such as augmented and virtual reality would affect and enhance the understanding of spacial relationships. We hope that with our research and design decisions that these principles would be applicable and effective in those mediums.

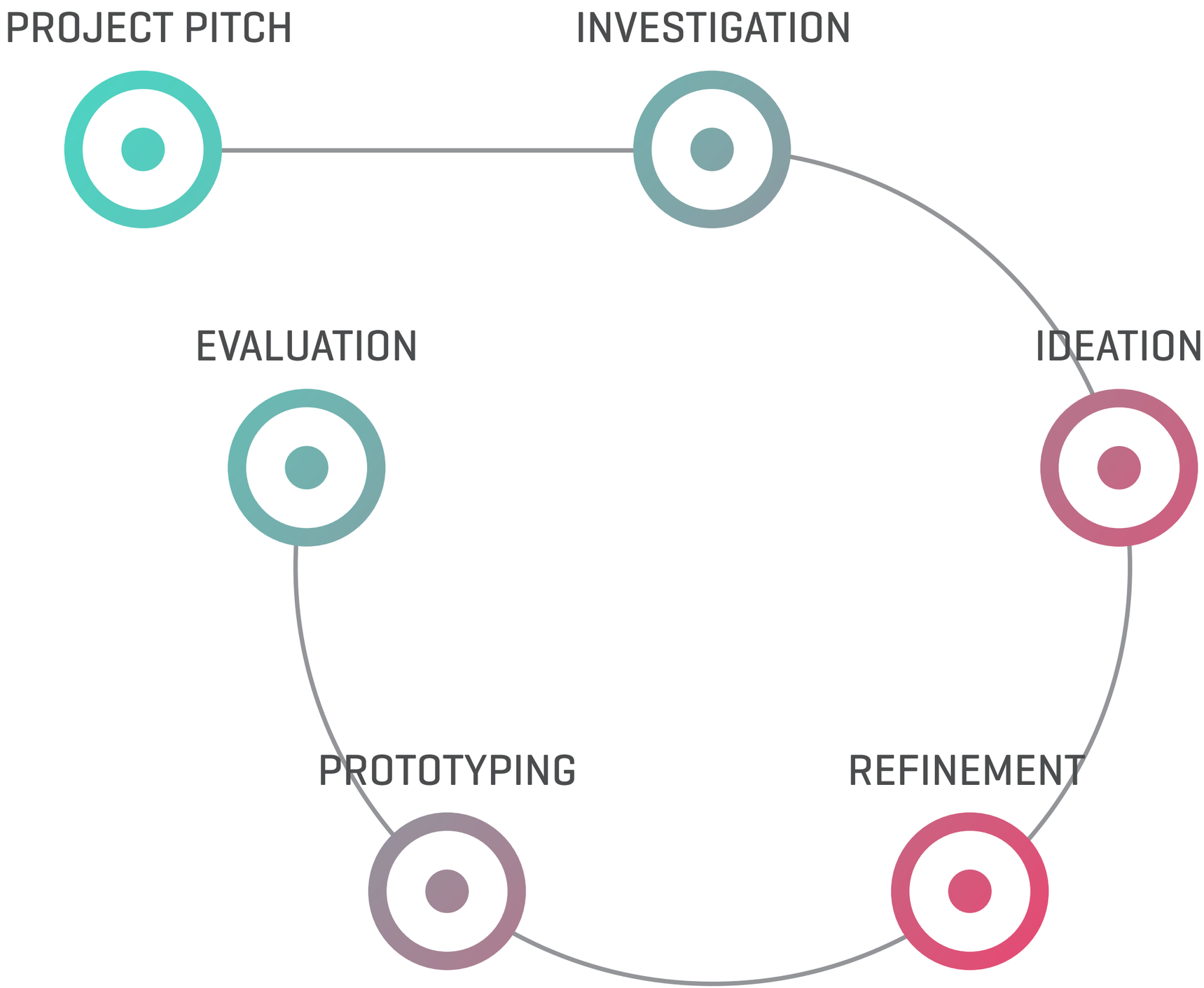
Loop is a result of an exploration of many different solutions to the product of DIY tutorial creation and consumption. We addressed each aspect of the learning model between learners and expert within Loop and think that the ideologies and proposed design decisions help to create a greater holistic learning experience for beginning DIY patrons.

Despite splitting up many of the responsibilities for those project, my main role was the product manager and overall lead of the project. I helped to make critical design decisions as well as contributing heavily to the thinking and creation of the different elements of the overall process. My interests in the DIY space propelled my commitment to the quality and effectiveness of our solution.

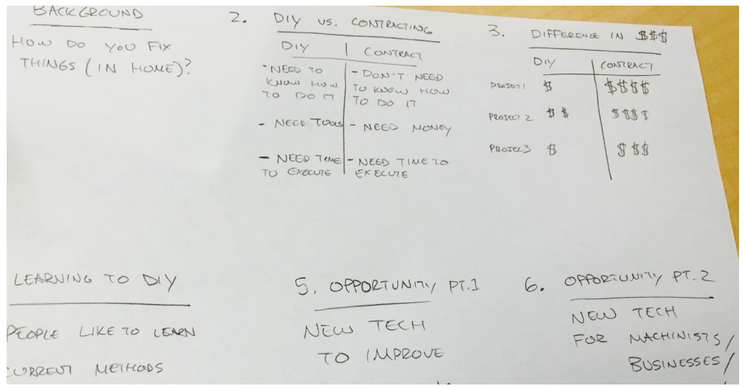
How can emerging technology improve the learning of hands-on skills in an impactful and meaningful way?

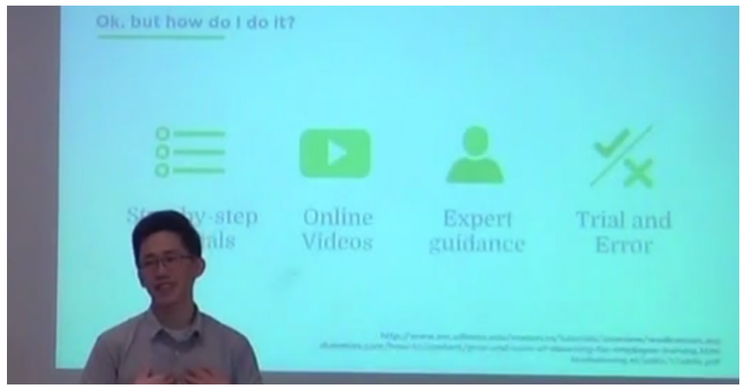
Our Process

Utilizing the user-centered design process, we explored the different aspects of DIY learning, and designed ways to incorporate technologies into facilitating learn in this growing field.


PROJECT PITCH
INVESTIGATION
IDEATION
EVALUATION
PROTOTYPING
REFINEMENT

Project Pitch





Our original pitch group focused on the study of common DIY projects around the household. We chose this space initially since we observed that a majority of DIY-oriented problems centered on fixing and maintenance occurred in the home space.

In our pitch, we focused on highlighting the differences between DIY and contracting practices and qualities. The main factors that provoke the desire to DIY are:

Saving Money

Feeling empowered through hands-on work

Gaining physical skills

Obtaining the ability to customize work

These factors contributed to the worth of exploring this field, and provided grounding for research on how we can further the growth of this increasingly popular activity and culture.

My contributions to the pitch included doing secondary research and gathering themes from the research for the presentation pitch. I also helped to develop the goals and direction of the project. This proved to be instrumentally in expanding my understanding of the space.

Along with the team, I presented key points of our pitch to potential sponsors and stakeholders.

Discovery & Investigation

Research Beginnings

In proceeding to the research phase, we first developed research questions with regards to the three main components of our potential system:

User

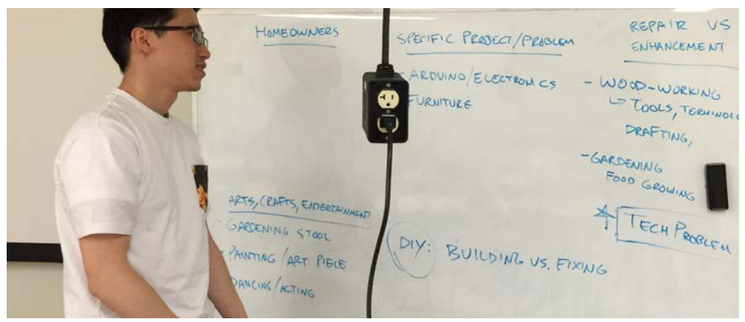
How do people currently learn DIY and craft skills?

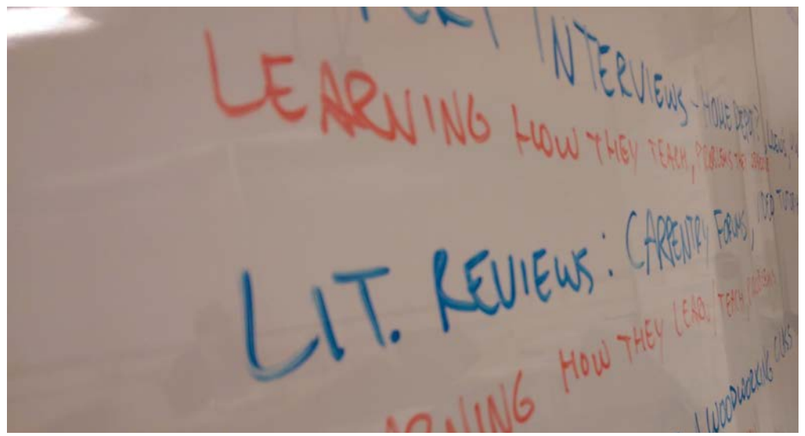
Tool

How does an expert understand the user's context to be able to help during a project?

Expert

What features are needed in a tool to facilitate an effective teaching/learning environment?

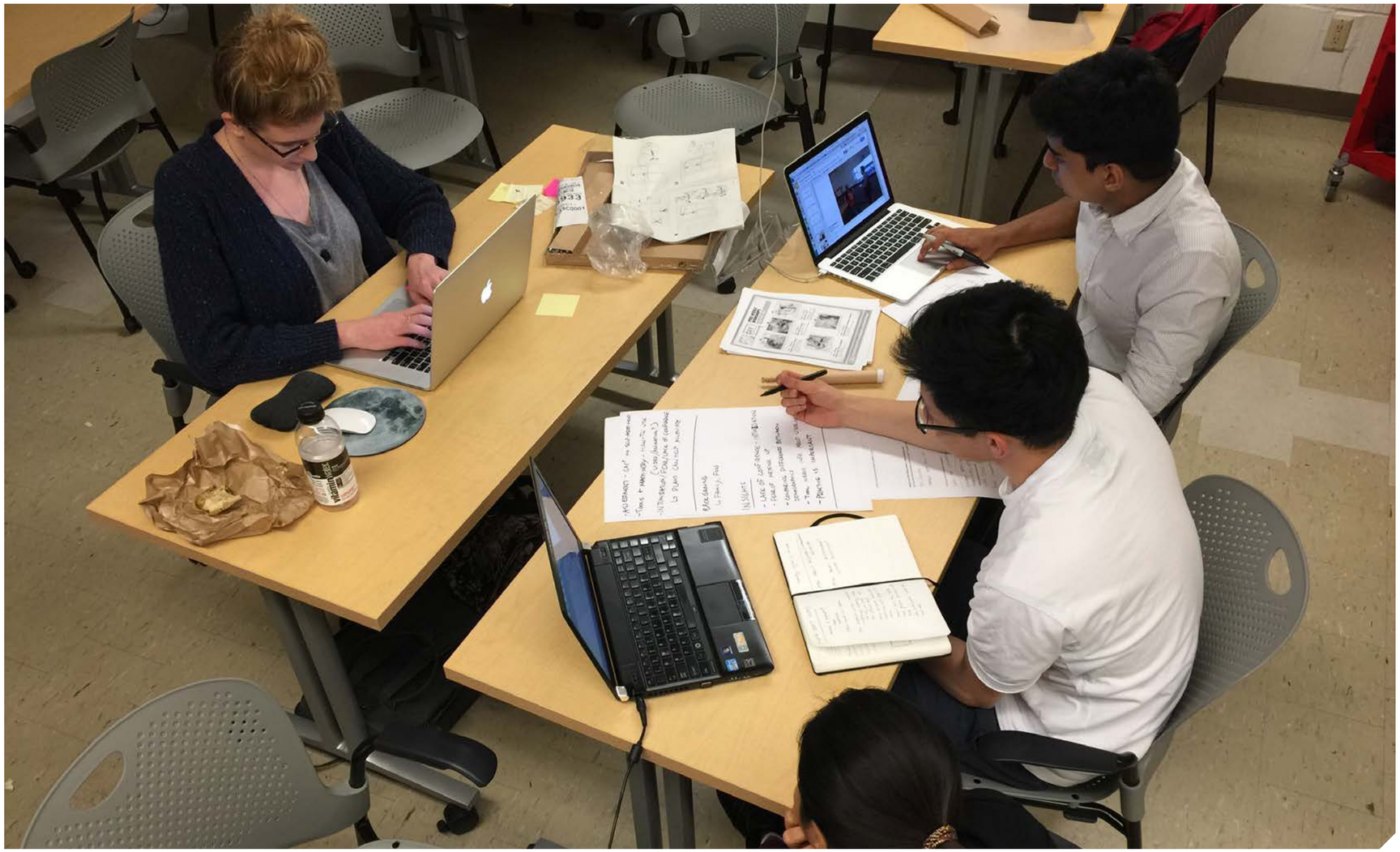




With these research questions, we sought to narrow down our problem space. Our newly formed group brainstormed of spaces within DIY to further explore and research. From this session, we arrived at woodworking-related projects. We wanted to embrace the idea of the maker-movement, focusing on the empowerment aspects of DIY and incorporating elements of the community as much as possible.

With the knowledge of our research space, we developed a research plan which guided our research activities. This plan included conducting expert interviews with those involved with woodworking, specifically teachers and instructors, observations of woodworking workshops or classes, and additional secondary research specifically of online woodworking tutorials.

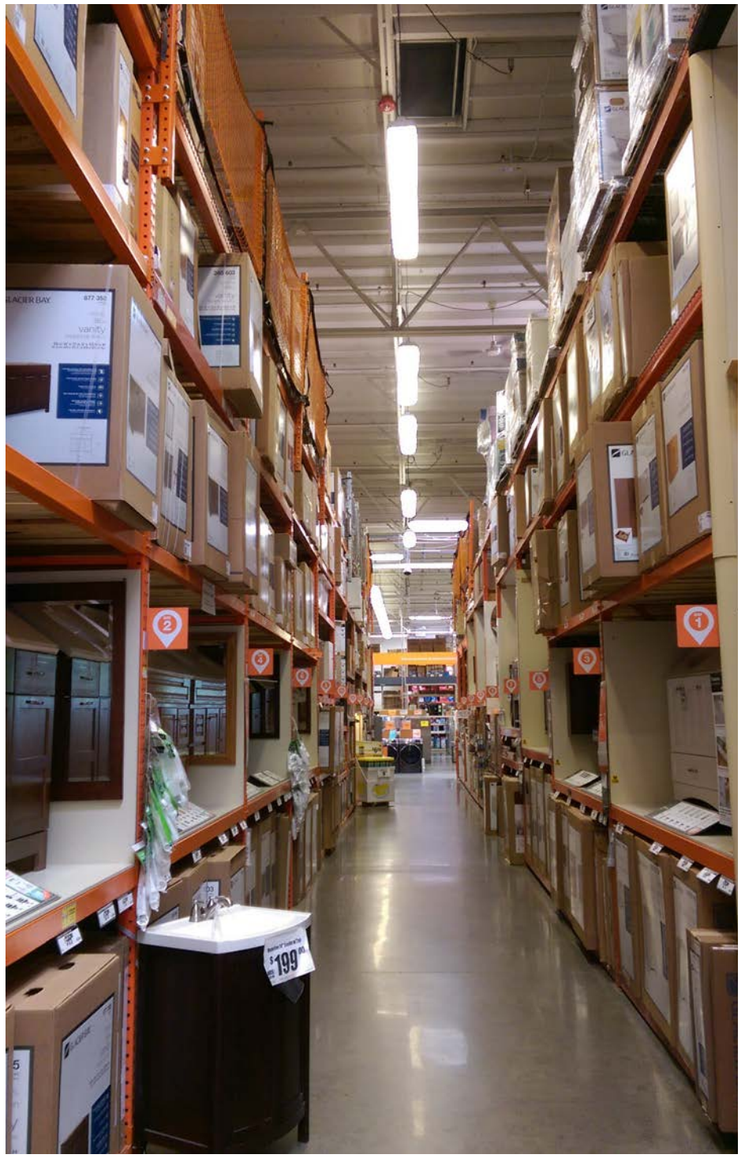
My contributions in this phase was leading the discussion and developing the research plan and the initial interaction model.



Initial Primary Research

In accordance with our research plan, Aaron and I looked into locating local experts who teach DIY crafts and skills. We were able to find a DIY workshop facilitator at a local hard store who specialized in teaching weekend classes about common DIY projects. Speaking with our expert greatly enlightened our understanding of the DIY space. She particularly mentioned that most novice DIYers have difficulties approaching a particular project or tool due to overall fear and intimidation.

We found this primary exploration of the problem space to be extremely helpful in guiding our decisions later on in the process. I found it exciting and invigorating going out into the field and learning about the problem space in a visceral manner.



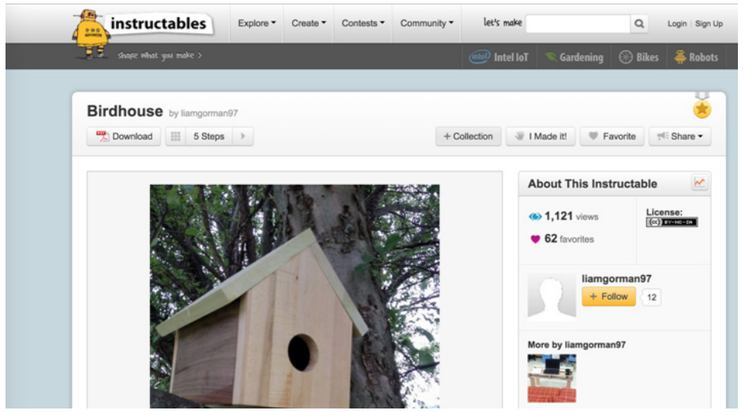
Main Findings

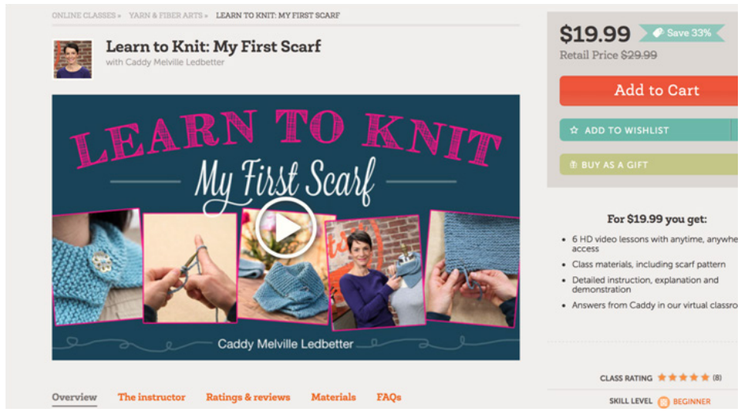
- *Projects are classified as either fun or for function*
- *Classes often involve physical interaction with tools and materials*
- *Intimidation and fear of tools, making errors, feeling incompetent, etc. were main barriers of entry*
- *Each step of the procedure is important to building confidence and to reduce fear*
- *Practice makes perfect*
- *Teachers instruct in a master-apprentice model and focus on assisting the learner instead of performing the action for them*
- *Novice learners have difficulties fixing and troubleshooting errors on their own*
- *The lack of understanding of the users' context in current tools is a big problem*

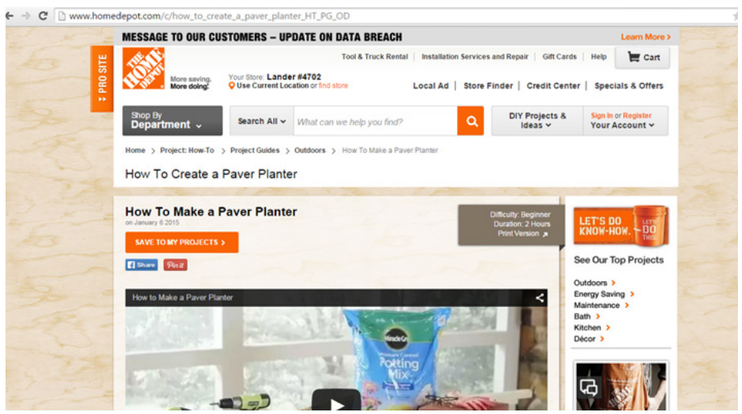
Secondary Research

A main portion of our secondary research was understanding the current online DIY tutorial platforms that are popular amongst the DIY community. We identified Instructables.com, Craftsy.com and hardware store-based tutorials, as the three main case studies for a competitive analysis based on heuristic and feature qualities. We selected these based on overall popularity amongst forums and community boards. We found that in many cases, the tutorials across these platforms were wildly inconsistent in terms of transparency of information and overall quality of content. The platforms that required payment to access the content did provide a higher threshold of quality.

For this exercise, I focused entirely on examining and evaluating a tutorial from Home Depot and noted the advantages and disadvantages of the system, as highlighted in the table on the right.







Heuristic Evaluation

	Craftsy	Notes	Instructables	Notes	Home Depot	Notes
Meta Information						
Project Duration	No	Not easily accessible; must add up all video times for total duration	Maybe	Depends on the author	Yes	
Skill Level	Yes	Beginner	No	Most authors do not	Yes	
Shows Finished Product	Yes	And product/project "trailer"	Yes		Yes	
Safety precautions	No				No	
Free Tutorial	No		Yes		Yes	
Materials						
Materials Needed	Yes	Full overview, list, and option to purchase kit	Maybe	Depends on the author	Yes	Also includes links to tools/materials
Where to Buy	Yes	Option to purchase kit through Craftsy website	Maybe	Some authors do	Yes/Indirectly	
Material Cost	Yes	But only if you buy the Craftsy kit	Maybe	Some authors do	Yes/Indirectly	
Content						
Images	No	Not of steps; only finished product and student-completed projects	Yes		Yes/Indirectly	Image of final product shown before entering the project
Text	No	Minimal text; only overview	Yes		Yes	Also has videos for each step
Videos	Yes	Primary mode of teaching	Maybe	But usually not for each step	Yes	
Structure						
Clearly Defined Steps	Yes		Yes*	* Depends on the author	Yes	
Navigate Steps	Yes		Yes		Yes	Each step by step video is short enough to consume in one full playthrough. The video in the beginning gives a overview of the materials needed. Scrolling to each step is easy.
Conciseness of Steps	Yes		Maybe	Depends on the author	Yes	
Consistency of Step Differentiation	Yes		Maybe	Depends on the author	No	Some steps have longer descriptions.
Troubleshooting		Entire section dedicated to troubleshooting				
Ability to Add Comments	Yes		Yes		Yes, but	There is no immediate way to add comments. You have to go to the forum section.
Ability to Ask Questions	Yes		Yes		Yes, but	Again, you have to go to the forum section.
Ability to Attach Photos (to Questions)	Yes		Yes		Yes	
Ability to comment on particular steps	Yes		No		No	

As we continued researching and developing research activities around woodworking, we quickly realized the inherent difficulties in engaging in this space. With the resources readily available to us, it appeared challenging to arrange observation activities and testing space based on the necessary materials and tools needed for basic woodworking. A woodworking studio and a bevy of hand/power tools would be necessary to conduct these observations. In addition, one of the main obstacles to doing woodworking is simply knowing what tools to use in certain situations. We were far more interested in the practice and development of muscle memory as an avenue of inquiry with respect to DIY hand skills.

This looks good so far...

but somethings not right...

As a result, the team decided to head into a new direction...

A new opportunity emerges...

During our research, we had stumbled upon doctoral research done by a local professor at the University of Washington. The research solely focused on the effect of technology on crafts and the relationships between the two. Specifically, her research revolved around the space of knitting, a craft that requires dexterity and hand skills with minimal material and tool requirements. Our team saw an opportunity and reprieve in this new space as it not only provided more approaching observation activities, but it also satisfied several of the criteria we were looking to test and design around. We took this as a sign to explore this space in greater detail.

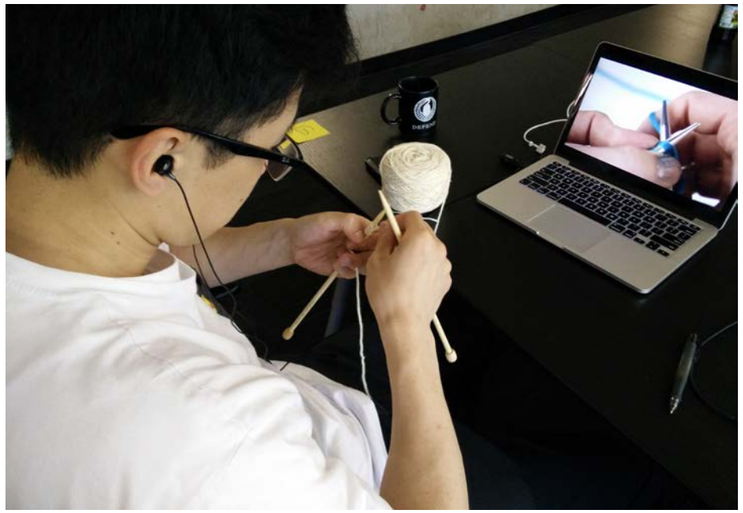
Guerrilla Research

"Am I doing this right?"

"Is the yarn too tight?"

"Where does the needle go?"

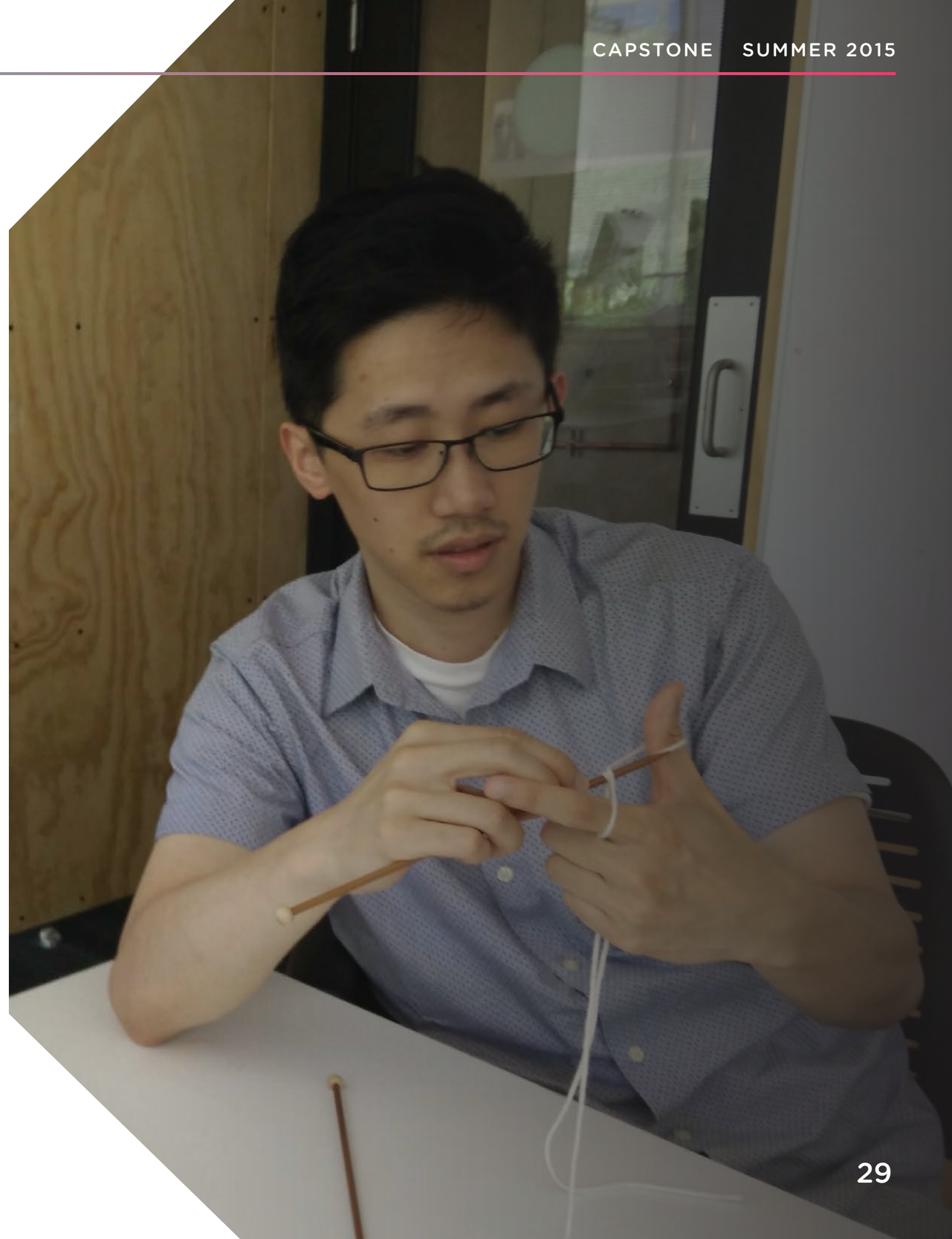
"I'm gonna start over..."



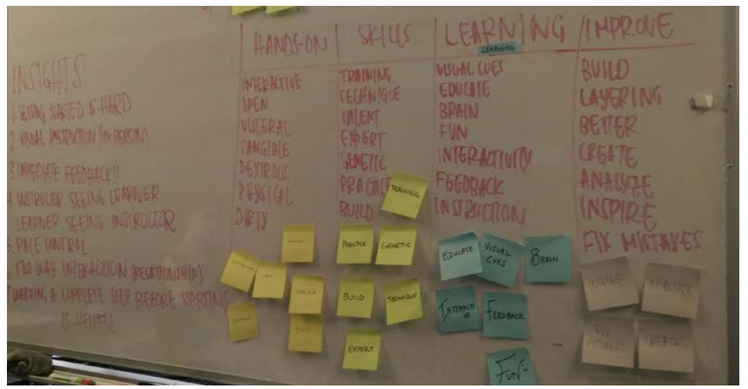
As a result of this drastic pivot, our team had to engage in guerrilla research to quickly learn about the intricacies of the space. We quickly obtained some needles and yarn and began perusing online video tutorials and resources, getting first hand experience of performing a cast-on and basic stitch pattern. We immediately found some of the most common pain points during these observations.

I would have never thought that I would be learning how to knit during this process. However, it proved to be useful as it further solidified the pain points we had observed through our primary and secondary research efforts.

In addition to learning through traditional online methods, we sought to gain experience of a real-time one-on-one interaction with an expert. I was a willing participant for this phase of the research since I was not able to complete the stitch in my previous attempts with the online tutorial. It was observed that at times, I would adjust my position in order to gain a better perspective of what the expert was doing. I also appreciated the immediate feedback and interaction with the expert in real-time, so I resolve any mistakes or receive clarification when needed. These proved to be key insights that would inform the later stages of our design process.



Ideation



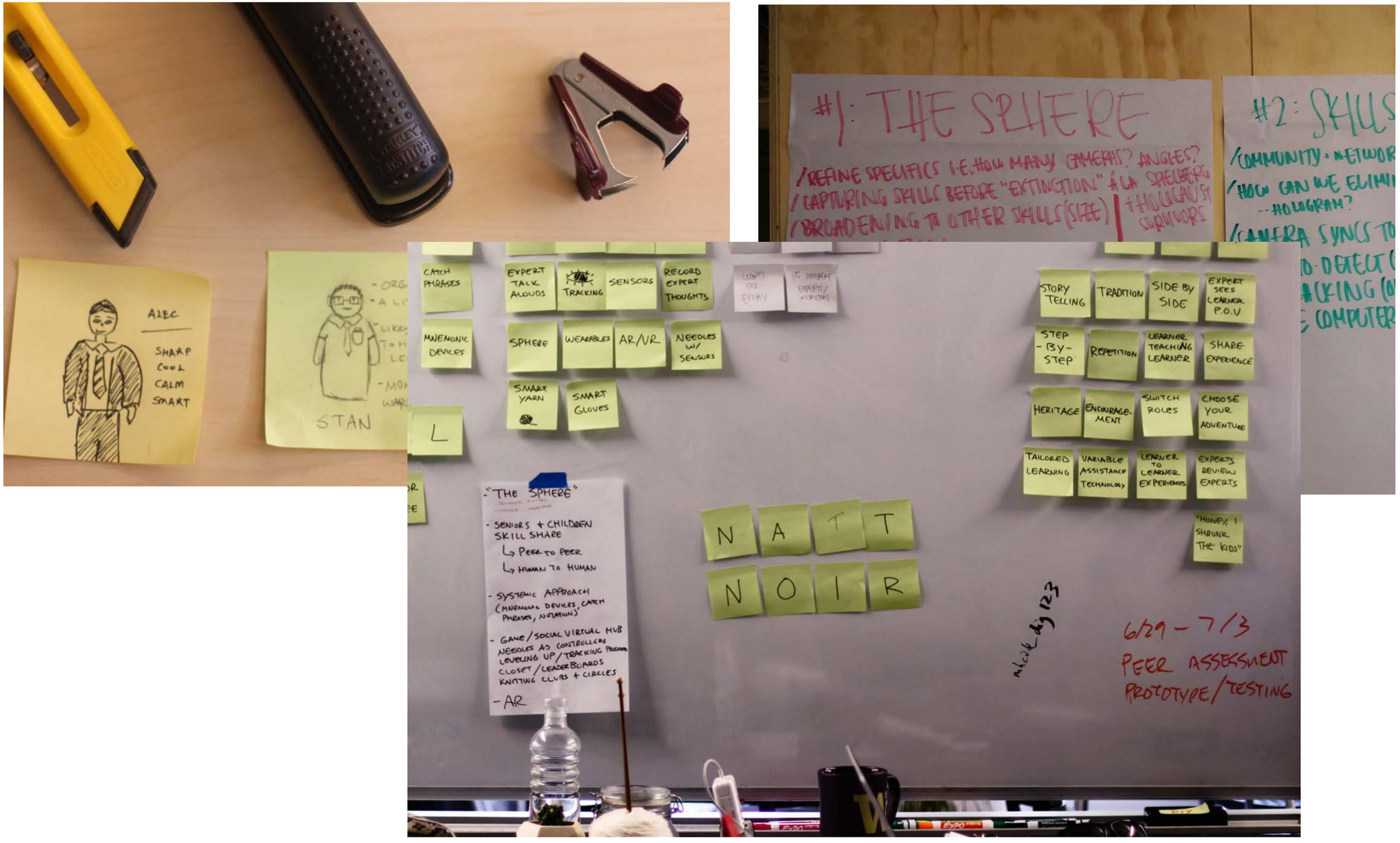
With the insights gathered from our research phase, we continued into the ideation phase of the design process. The ideation phase was propelled with a bevy of different brainstorming exercises, which included word association, value proposition creation, and feature brainstorming. Our goal was to brainstorm ideas that span across different fidelities of technology and that would solve various aspects of the problem space. We grouped our ideas into several buckets, including interaction design, social features, and ways to incorporate gaming characteristics.

We were successful in ideating ways to not only incorporate technologies creatively, but also to integrate the human element associated with craft learning. For us, keeping the tradition and the element of "passing down" skills was important to retain in whatever solution we could think of. This helped us maintain the interesting juxtaposition of craft and technology.

For concept development, I participated in producing the sketches and storyboards for two of the main concepts we presented.

The two concepts I was in charge of delivering were a knitting-based game and an AR-assisted learning system. The knitting game was interesting in that we could provide a platform that inherently provides users a way to practice and improve their skills. A game also can help to leverage community building by creating hubs within the game for people to connect and knit together.

The AR-assisted learning system was one of our most exciting ideas since it can use emerging technologies to heighten the experience of learning how to knit. We think that it can also prove to be an effective solution since it can virtually represent the 3D interaction and movement in space of knitting in a clear way.


#1: THE SPHERE
/REFINE SPECIFICS I.E. HOW MANY CAMERAS? ANGLES?
/CAPTURING SKILLS BEFORE "EXTINCTION" & LA SPELUNCA
/BROADENING TO OTHER SKILLS (SIZE)
HOLOCAUST SURVIVORS
#2: SKILLS
/COMMUNITY - NETWORK
/HOW CAN WE ELIMINATE --HOLOGRAM?
/CAMERA SYNCS TO
ALEC
SHARP
COOL
CALM
SMART
STAN
CATCH PHRASES
EXPERT TALK ALOUDS
TRACKING
SENSORS
RECORD EXPERT THOUGHTS
MNEMONIC DEVICES
SPHERE
WEARABLES
AR/VR
NEEDLES W/ SENSORS
SMART YARN
SMART GLOVES
STORY TELLING
TRADITION
SIDE BY SIDE
EXPERT SEES LEARNER P.O.V
STEP - BY - STEP
REPETITION
LEARNER TEACHING LEARNER
SHARE EXPERIENCE
HERITAGE
ENCOURAGEMENT
SWITCH ROLES
CHOOSE YOUR ADVENTURE
TAILORED LEARNING
VARIABLE ASSISTANCE TECHNOLOGY
LEARNER TO LEARNER EXPERIENCES
EXPERTS REVIEW EXPERTS
"HONEY, I SHRUNK THE KIDS"
"THE SPHERE"
- SENIORS + CHILDREN SKILL SHARE
↳ PEER TO PEER
↳ HUMAN TO HUMAN
- SYSTEMIC APPROACH (MNEMONIC DEVICES, CATCH PHRASES, NOTATION)
- GAME/SOCIAL VIRTUAL HUB
NEEDLES AS CONTROLLERS
LEVELING UP/TRACKING PROGRESS
CLOSET/LEADERBOARDS
KNITTING CLUBS + CIRCLES
- AR
N A T T
N O I R
6/29 - 7/3
PEER ASSESSMENT
PROTOTYPE/TESTING

Sketches


NEEDLE CONTROLLERS
KNITHUB
VIRTUAL CLOSETS
ONLINE KNITTING CL
LEVEL UP +1
NEXT STITCH...
5 POINTS
THE SPHERE
Tim wants to learn some more stitches.
KNITHUB
Using his needle controllers, he launches KnitHub.
He sees the main hub area as well as a few users.
LVL. 16
He begins a level in KnitHub and tries to complete the stitch with the help of the sensors on the needles...
COMPLETE THE KNIT ROW STITCH
He's finished the stitch!
GREAT JOB! YOU FINISHED YOUR KNIT ROW STITCH!
CONTINUE
RETRY
RETURN
He returns to the hub and can see other users' stats of the stitch.
LVL. 11
360°

Sketches


1ST PERSON VIEWS
AR
VIRTUAL EXPERTS
THE SPHERE
John wants to learn how to knit!
He first tries an online tutorial...
He's having a hard time with the stitch and is not sure what to do...
He puts on his AR device...
and searches for a tutorial...
He is surprised with the appearance of a virtual expert!
He is able to fix his mistakes with the help of the expert!

Prototyping

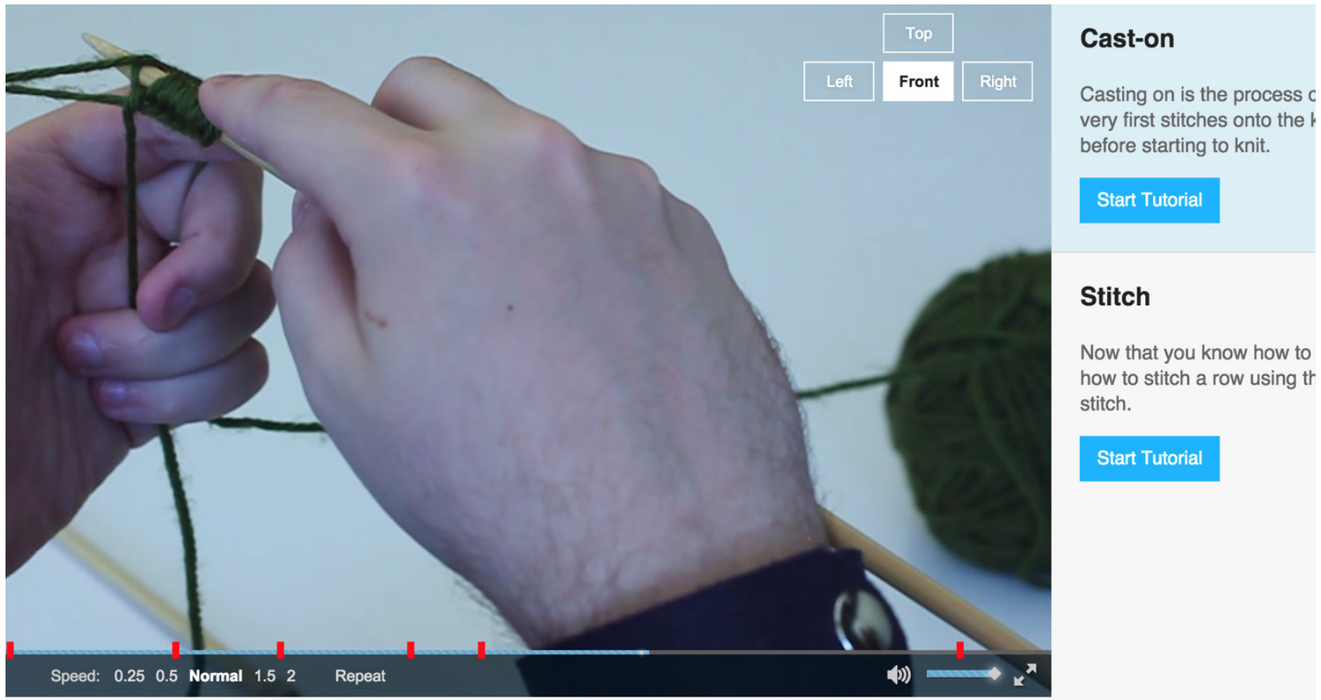
Evaluation

We evaluated our prototypes respectively along the way as we tested different elements of our proposed solution. This was so we could iterate and improve to infer the creation of the next prototype. We based our evaluation on these principles:

We found that by ideally giving users an optimal perspective and an adaptive experience, users would be able to learn craft skills more effectively.

OPTIMAL PERSPECTIVE	ADAPTIVE EXPERIENCE
1st Person View	Variable Pacing
3-Dimensional	Tailored Instruction
Multiple/Flexible	Immediate Feedback

Prototype #1



During the research phase, we had an hypothesis with regards to how to improve current online tutorials:

Do multiple angles in a video tutorial improve the learning experience?

To test this, we decided to prototype a new video player platform that allows users to change the viewing angle of the video. We also added additional features that we found our either missing from current tools or were not shown to users immediately. These features include:

Changing Playback Speed

Adding Markers to the Timeline

Repeating a Section of Video

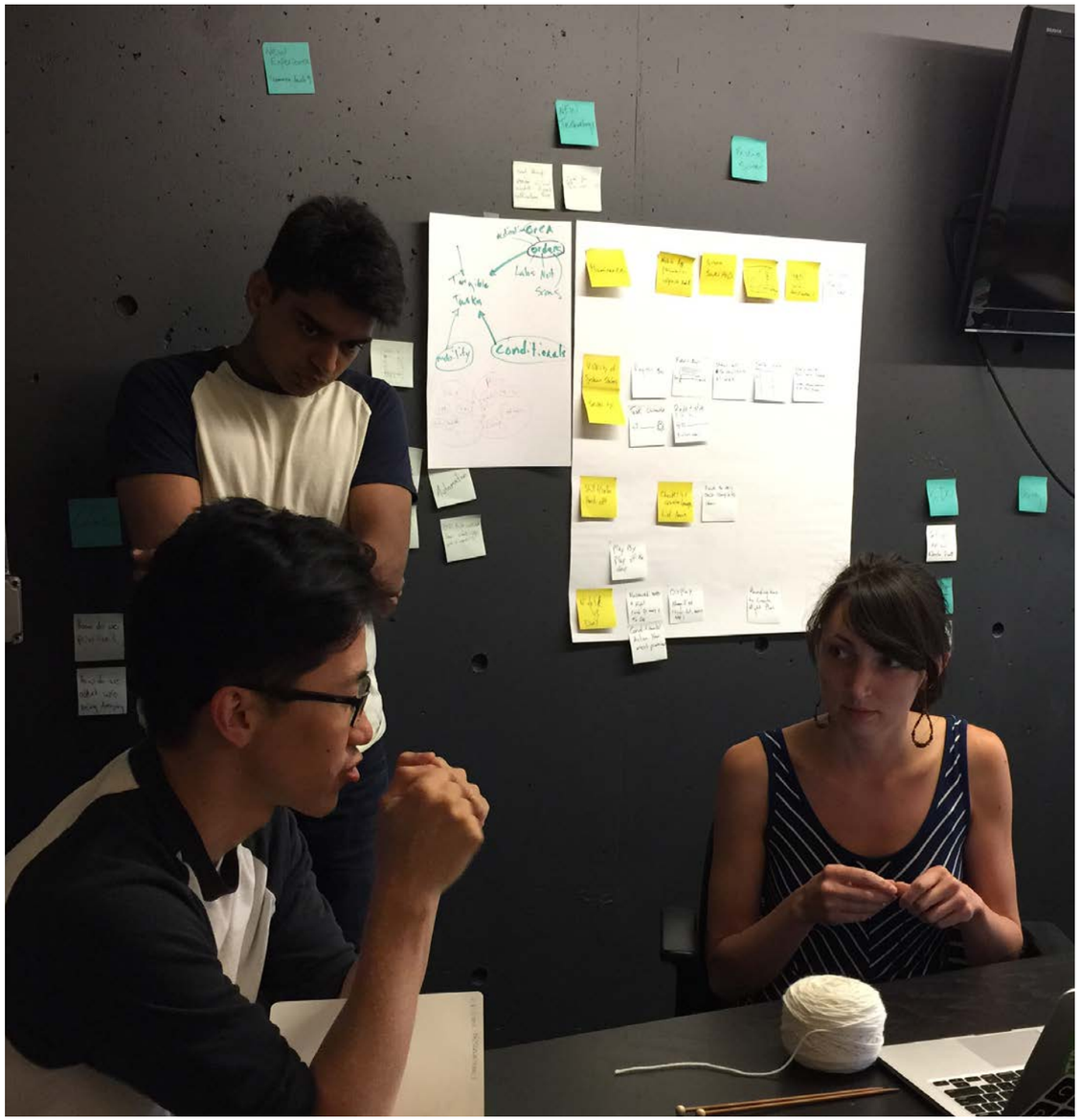
Zooming into Different Parts of the Video

I contributed heavily to setting up the video cameras in order to achieve the optimal viewing angles for a potential user. I also created the video and audio artifacts that would later be used in our video player prototype.

Setup #1

Setup #2

Findings



With our video prototype, we did some initial testing with users to see what features stood out. Users indicated that the multiple angles were helpful in deciphering the steps. It was noted that giving the users the options to switch the views was an important step to understanding user context.

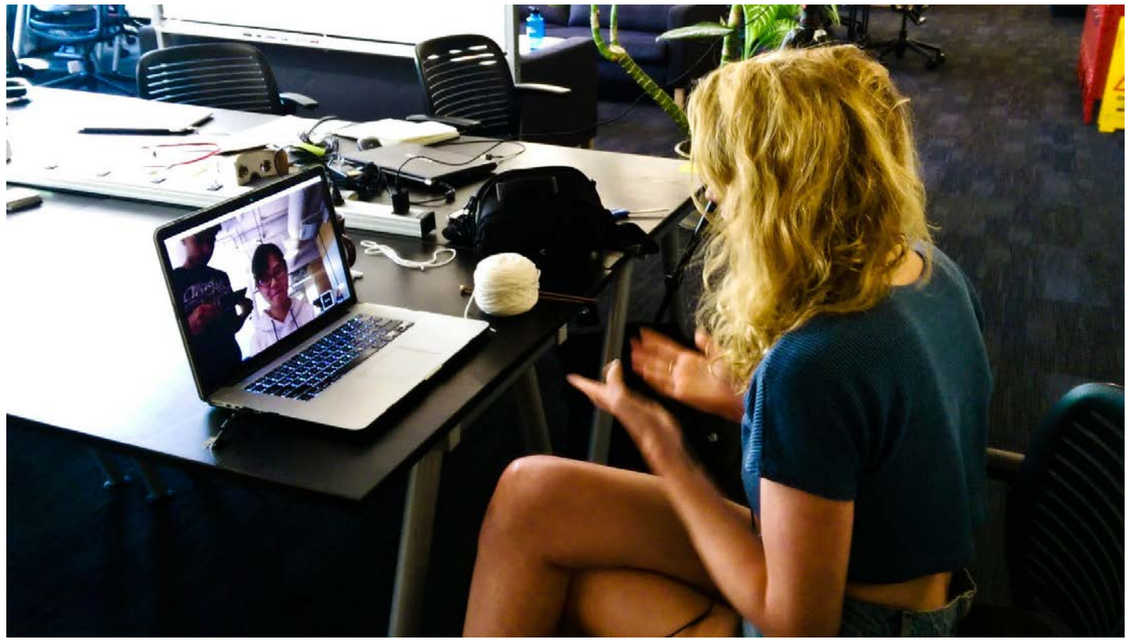
We were surprised to find that some of the additional functionality, such as creating repeat loops and scrubbing the tutorial with markers were vastly underutilized. It was remarked that it was too much more effort to create them just to navigate the tutorial.

I participated in the observations and the debriefing of the participants. I enjoy inquiring about user actions and how we can use these insights in later design decisions.

Evaluation

OPTIMAL PERSPECTIVE		ADAPTIVE EXPERIENCE	
1st Person View	✓	Variable Pacing	X
3-Dimensional	X	Tailored Instruction	X
Multiple/Flexible	✓	Immediate Feedback	X

Prototype #2



Our second prototype aimed at tackling our problem at a different angle:

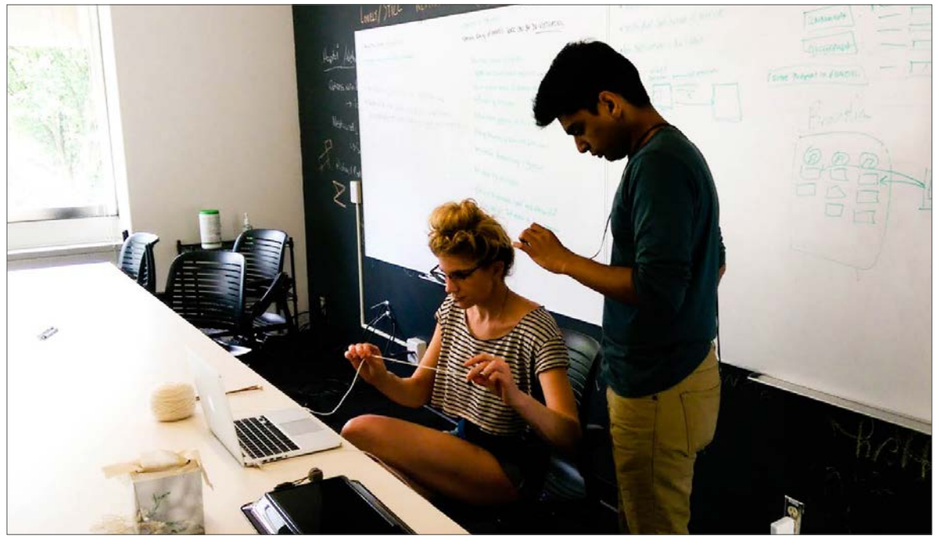
What types of feedback and perspectives can create an effective teaching model in a remote setting?

For our prototype, we used Google Hangouts to facilitate the communication between an expert and a learner. We also used an additional camera for each person in order to capture their first-person perspective. We had learned from the previous prototype that the first-person view was the most helpful in learning basic knitting skills. We set up our expert and participant in separate locations and ran a basic tutorial to understanding the interaction elements.

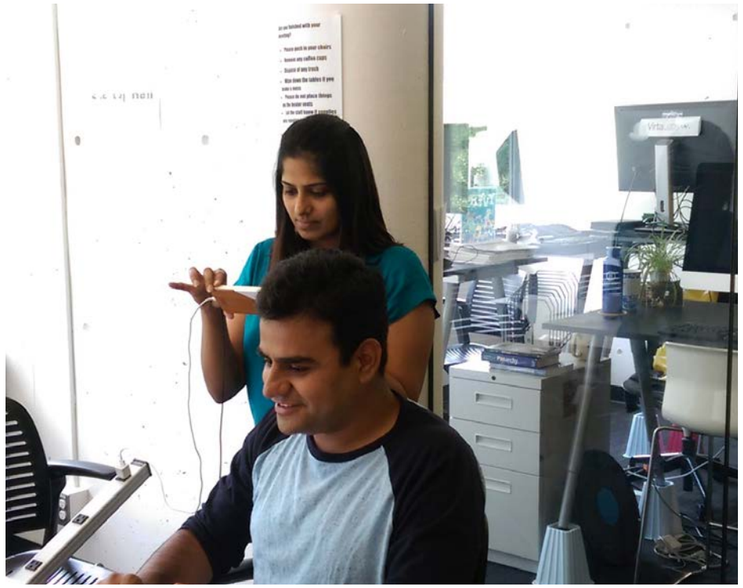
My contribution for this prototype was helping to develop the concept of the prototype and testing. I was in charge of making sure the testing went smoothly and also was part of in the debrief of our participants.

Recoding of Session

Use of Phone and Web cams for Additional Cameras



Findings



We saw immediate success with this prototype. We had three participants test this prototype and we found that having an expert to guide and assess the progress of the learner was incredibly effective. Not only was the extra view given by the additional camera proficient at making the instruction more contextual, the ability for the expert to give immediate feedback decreased the amount of time for the learner to grasp the concepts.

This method was so impactful that we decided to look into making our solution less reliant on an actual human to fix and correct potential mistakes. As such as investigated on how to make our system asynchronous and independent of on-demand help from a human expert.

Evaluation

OPTIMAL PERSPECTIVE

1st Person View ✓

3-Dimensional ✗

Multiple/Flexible ✓

ADAPTIVE EXPERIENCE

Variable Pacing ✓

Tailored Instruction ✓

Immediate Feedback ✓

Prototype #3

The third prototype we developed was something much more out of the box.

What value does 3D add in the learning of hands-on skills?

Due to our technical limitations in attempting to create a convincing three-dimensional representation of a tutorial, we had to brainstorm on how we can somehow portray 3D information across to a user. We settled on the idea of using an actual human to be our 3D representation. Our concept was to have Lauren, our local "expert", simulate the responsiveness and behavior of a traditional video tutorial.

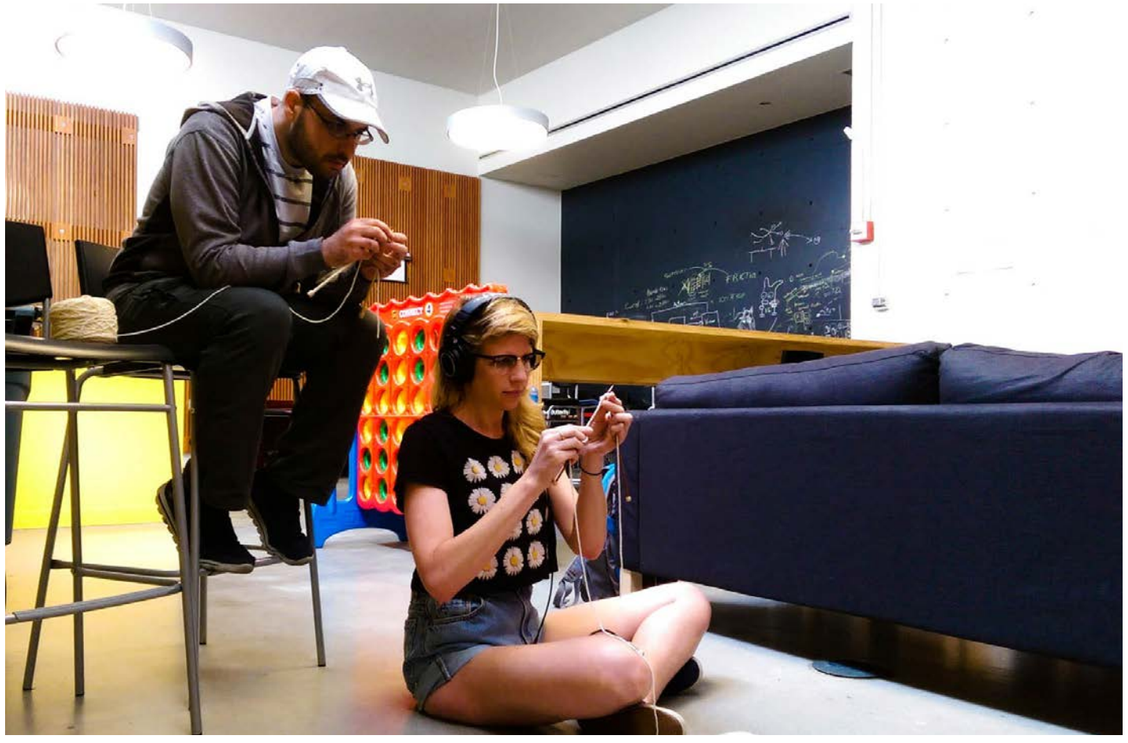
To set this up, our "expert" Lauren would sit in front of our learner (Ranj in the above example). Lauren would not be able to hear or see anything of the user and could only respond to voice commands given by the user. Aaron's role in this setup was to simply relay the voice commands and point to the respective playback control for Lauren. Users also were given the ability to move around the tutorial at will and were not constrained to sitting behind Lauren.

I helped develop the framework of this prototype. My duties during the testing were to introduce our participants, make observations, and take process photos.

Brainstorming

Planning the Setup

Findings



This prototype proved to be the most interesting in terms of setup and findings. We found it compelling that despite not telling the users that they were freely able to move in 3D space, they would adjust their positions to gain a better view, which matches what we observed in the real-time person-to-person interactions. We also discovered that even though Lauren could not see or hear the user, she would instinctively alter her instruction based on how the user would control the tutorial. For example, if the user would rewind and slow down the tutorial frequently, she would **naturally slow down the pace and add more verbal instruction**. This insight would later become one of the most important features of our final design.

Evaluation

OPTIMAL PERSPECTIVE		ADAPTIVE EXPERIENCE	
1st Person View	✓	Variable Pacing	X
3-Dimensional	✓	Tailored Instruction	X
Multiple/Flexible	✓	Immediate Feedback	X

Final Prototype

Our final prototype aimed to incorporate all the learnings and insights from the previous prototypes:

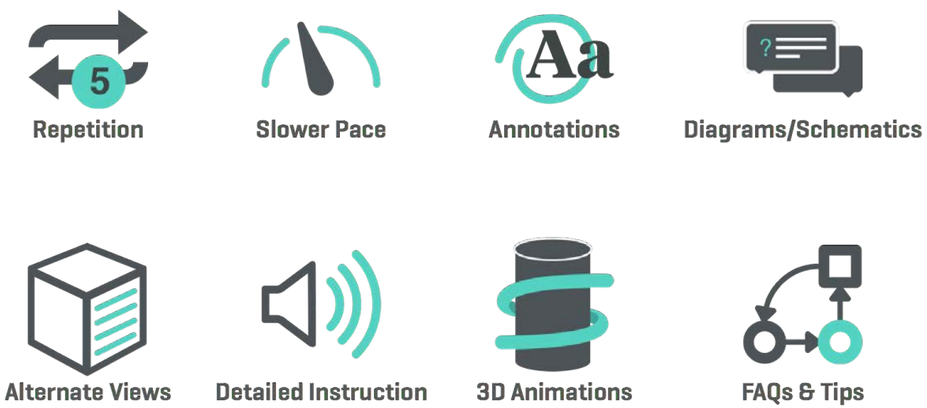
How can we incorporate adaptive and tailored learning principles with optimal perspectives in one asynchronous tool?

To begin, we decided to continue with the form factor of the first prototype as it is an approachable and popular medium to house a tutorial. To incorporate aspects of adaptive learning, we developed three tracks based on pacing and the revelations realized in the last prototype. We also aimed to include voice input as the main control mechanism since most craft skills require the use of both hands in order to manipulate tools and materials.

The tracks were developed to accommodate for different kinds of learners. As such, these tracks have various levels and types of instruction and guidance. We found that there are eight features that can be implemented to give extra context within a tutorial.

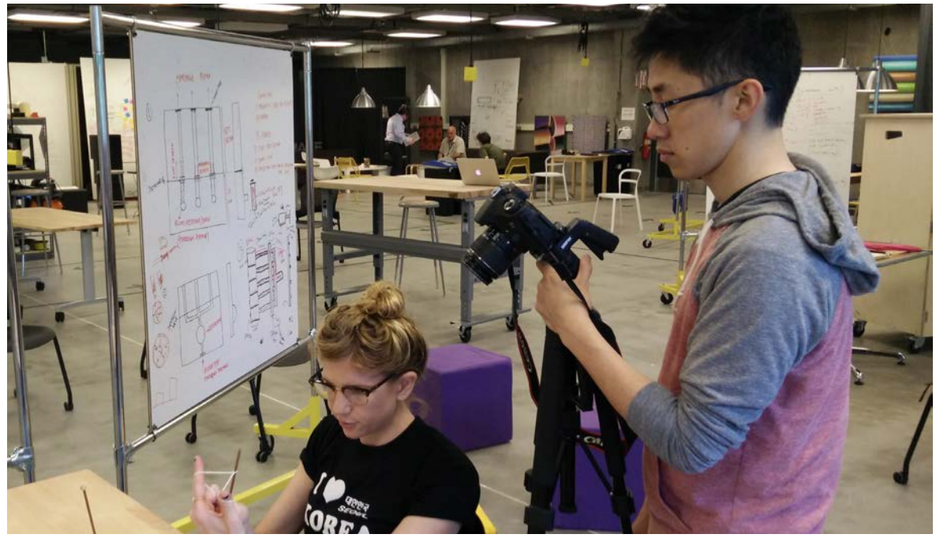
To make these tracks adaptive, we developed a framework to help guide the user to the appropriate-paced tutorial. To find out how the system works technically, refer to the appendix.

The eight features used to augment tutorials include:



These features can be added to the tutorial either during or post-creation. Additionally, some of these features can be sourced from other users or experts. This is our solution of implementing feedback and troubleshooting to an tool that is predominately asynchronous.

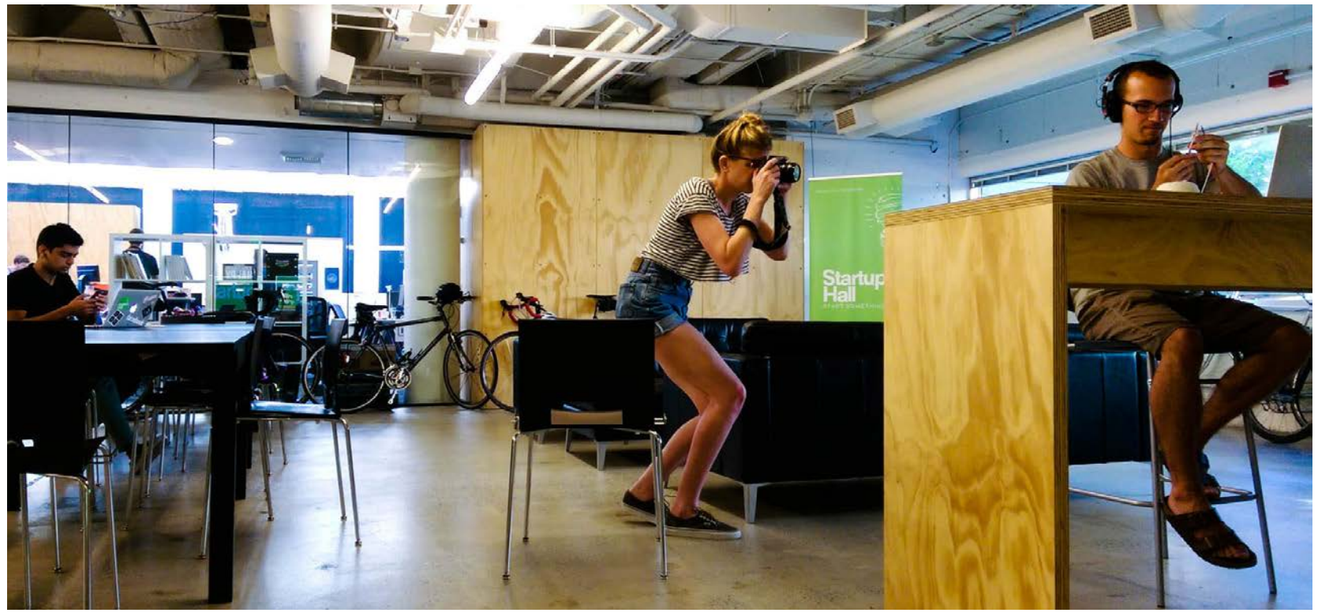
During this portion of the process, I created the videos for the tutorials used for the upcoming evaluations, helped lead the development of the behavioral prototype, assisted in design thinking of the features and the overall system functions, performed observations, and oversaw the overall production of the entire process.

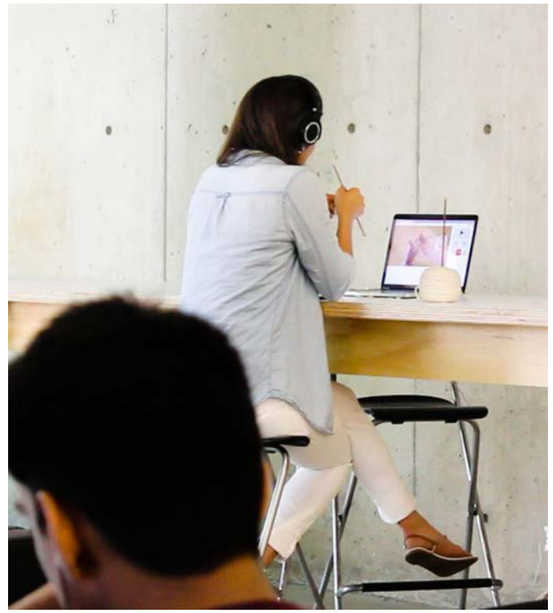


Recording the Video Tutorial

Developing the Video Tutorial

Findings

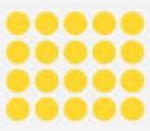




We recruited seven participants of various crafting experience to test our behavioral prototype. We simulated the voice control and had Aaron control the playback of the video from a remote computer. Users were also given the choice to change tracks via prompts based on behavior that Aaron observed. We found interesting results across our seven users spanning from success of the tutorial within thirty minutes to a couple participants quitting after some frustration. There were also some technical difficulties experienced with the nature of our prototype, since it was built with HTML/CSS and lived on a remote server. However, we were able to gleam enough results to make some judgments.

On the right is a table showing data of the playback controls and other details of each of the participants.

Evaluation

PLAY	PAUSE	BACK	FWD	SPEED ↑	SPEED ↓	Time on BEGINNER	Time on INT	Time on ADVANCED	COMPLETION TIME
						14:02	14:30	-	28:32
						18:14	14:01	-	32:15
						-	11:42	-	11:42
						-	1:32	5:30	7:02
						16:26	5:13	4:37	26:16
						-	12:55	-	12:55*

Final Design

LOOP

For our final design, we had decided to use one of our previous ideas of using AR as the medium to portray our solution. We had shown that our features were immediately implementable and that the missing piece was incorporating an effective way of showing 3D content. We concluded that with the new approach of AR/VR/Mixed Reality systems in the forefront, this was an exciting opportunity to show how our thinking can be applied to an emerging technology

LOOP consists of three main components:

Info Panel

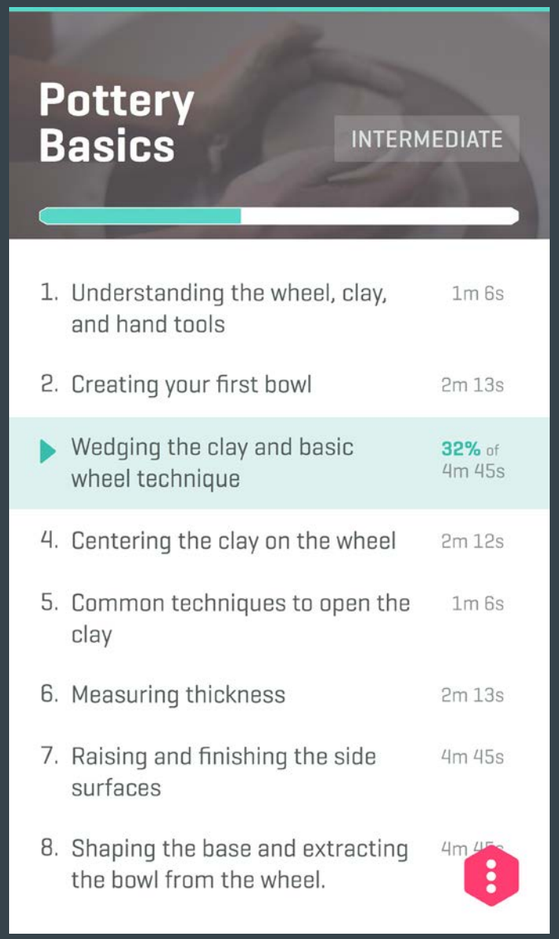
Hologram

Playback bar

My contributions to the final design include visual design, interface design, motion design, and information design.


Pottery Basics
INTERMEDIATE
1. Understanding the wheel, clay, and hand tools 1m 6s
2. Creating your first bowl 2m 13s
Wedging the clay and basic wheel technique 32% of 4m 45s
4. Centering the clay on the wheel 2m 12s
5. Common techniques to open the clay 1m 6s
6. Measuring thickness 2m 13s
7. Raising and finishing the side surfaces 4m 45s
8. Shaping the base and extracting the bowl from the wheel.
STOP
HIGH

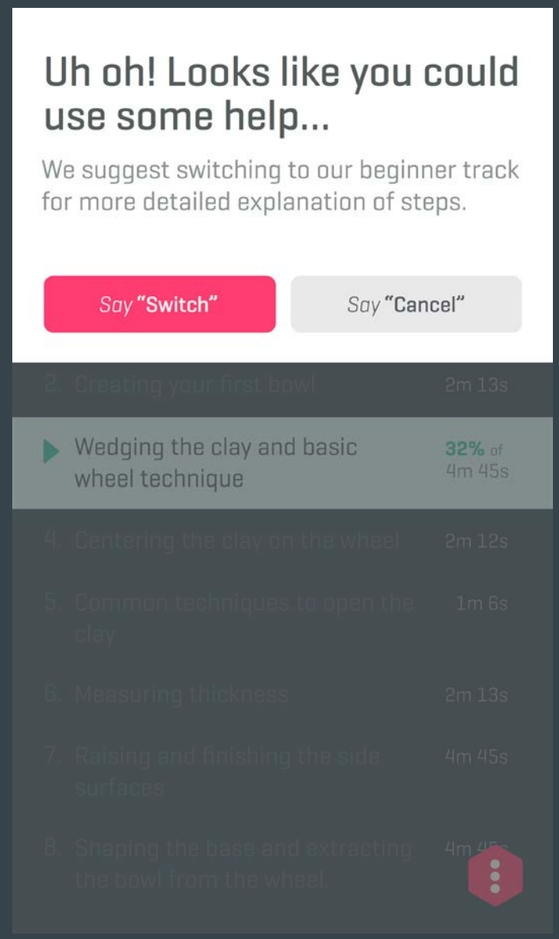
Info Panel



The info panel displays additional information based on the stage of the tutorial. During the tutorial, the info panel populates with information about each step of the tutorial. It features the duration of each step as well as the current progress within the current step.

The tutorial difficulty level is displayed in the top-right corner. This will change based on whether the user decided to switch tracks. When the system prompts the user, a text dialog on the right with appear at the top of the info panel. The tutorial as a whole will also pause and fade to gray to help guide the user to the prompt. Users can simply just say “Switch” or “Cancel” to leave the dialog. Upon dismissing the prompt, the tutorial will resume and make adjustments based on the track.

The action button at the bottom-right corner houses all additional actions. These include but are not limited to the ability to add a tag, manually change the track, and access any settings or profile information.




Pottery Basics
INTERMEDIATE
1. Understanding the wheel, clay, and hand tools 1m 6s
2. Creating your first bowl 2m 13s
Wedging the clay and basic wheel technique 32% of 4m 45s
4. Centering the clay on the wheel 2m 12s
5. Common techniques to open the clay 1m 6s
6. Measuring thickness 2m 13s
7. Raising and finishing the side surfaces 4m 45s
8. Shaping the base and extracting the bowl from the wheel.

Info Panel

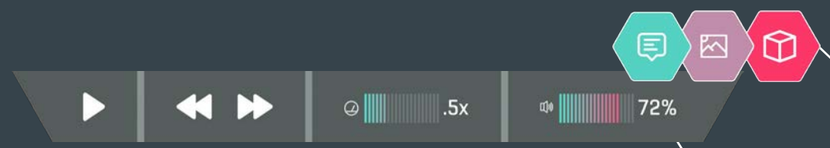
Hologram

The hologram is used to represent the craft in three dimensions. The user is able to freely move in 3D space in order to gain different perspectives. Since the user is not constrained by the form factor of the tutorial, they can have access to the tutorial unbound and untethered to a computer screen.

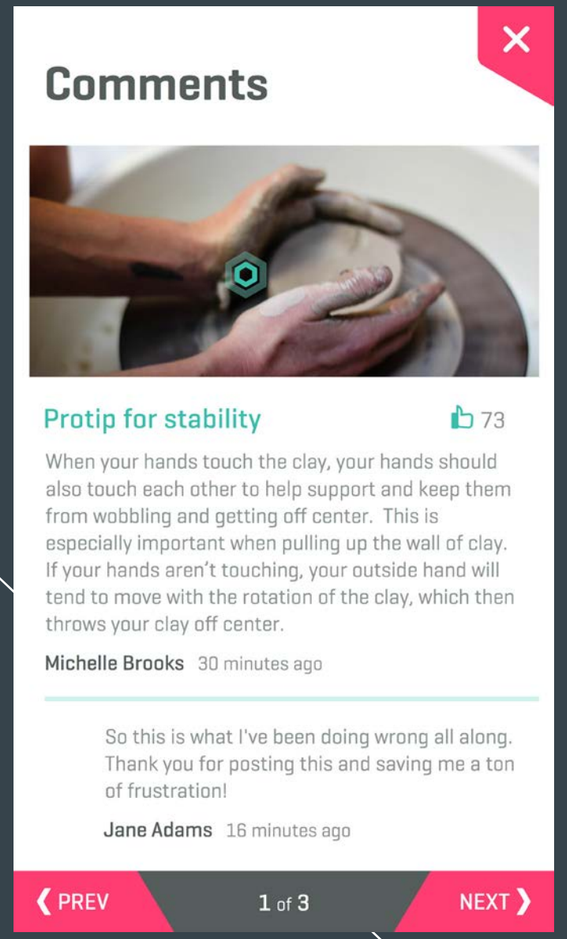

Pottery Basics
INTERMEDIATE
1. Understanding the wheel, clay, and hand tools 1m 6s
2. Creating your first bowl 2m 13s
Wedging the clay and basic wheel technique 32% of 4m 45s
4. Centering the clay on the wheel 2m 12s
5. Common techniques to open the clay 1m 6s
6. Measuring thickness 2m 13s
7. Raising and finishing the side surfaces 4m 45s
8. Shaping the base and extracting the bowl from the wheel. 4m
STOP
HIGH

Hologram

Playback Bar



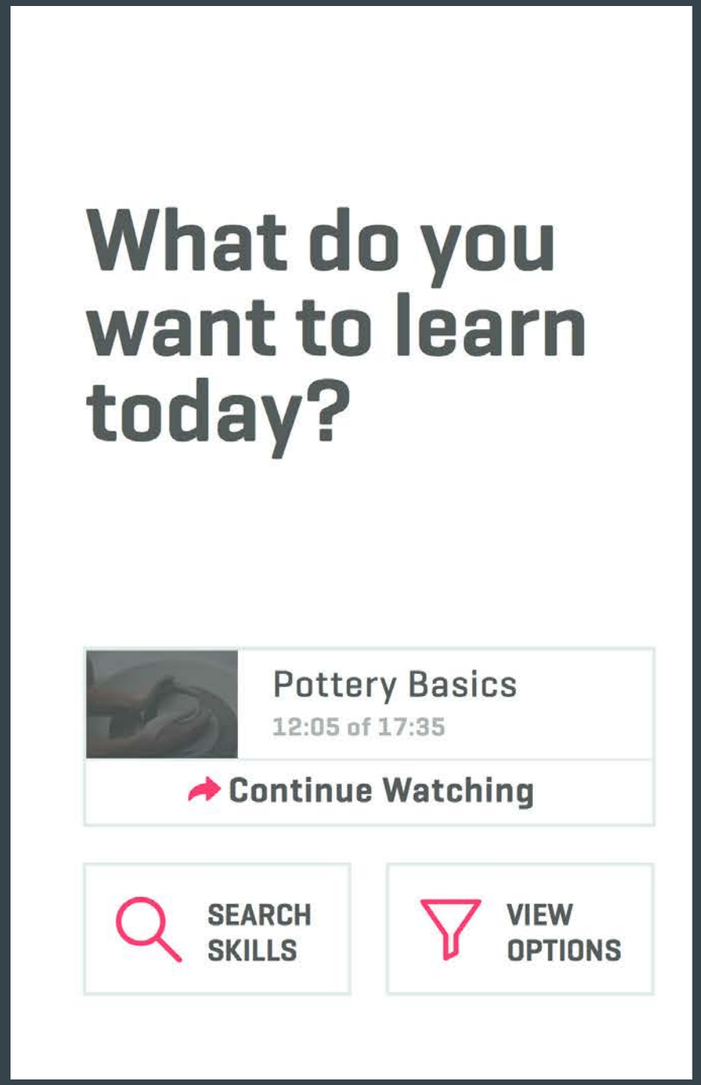
The playback bar gives visual feedback based on the user's playback commands via voice input. The additional help via annotations provided by the expert and community also appear close to the proximity of the bar. When annotations are activated by the user, the tutorial is paused and relevant information populates the info panel.

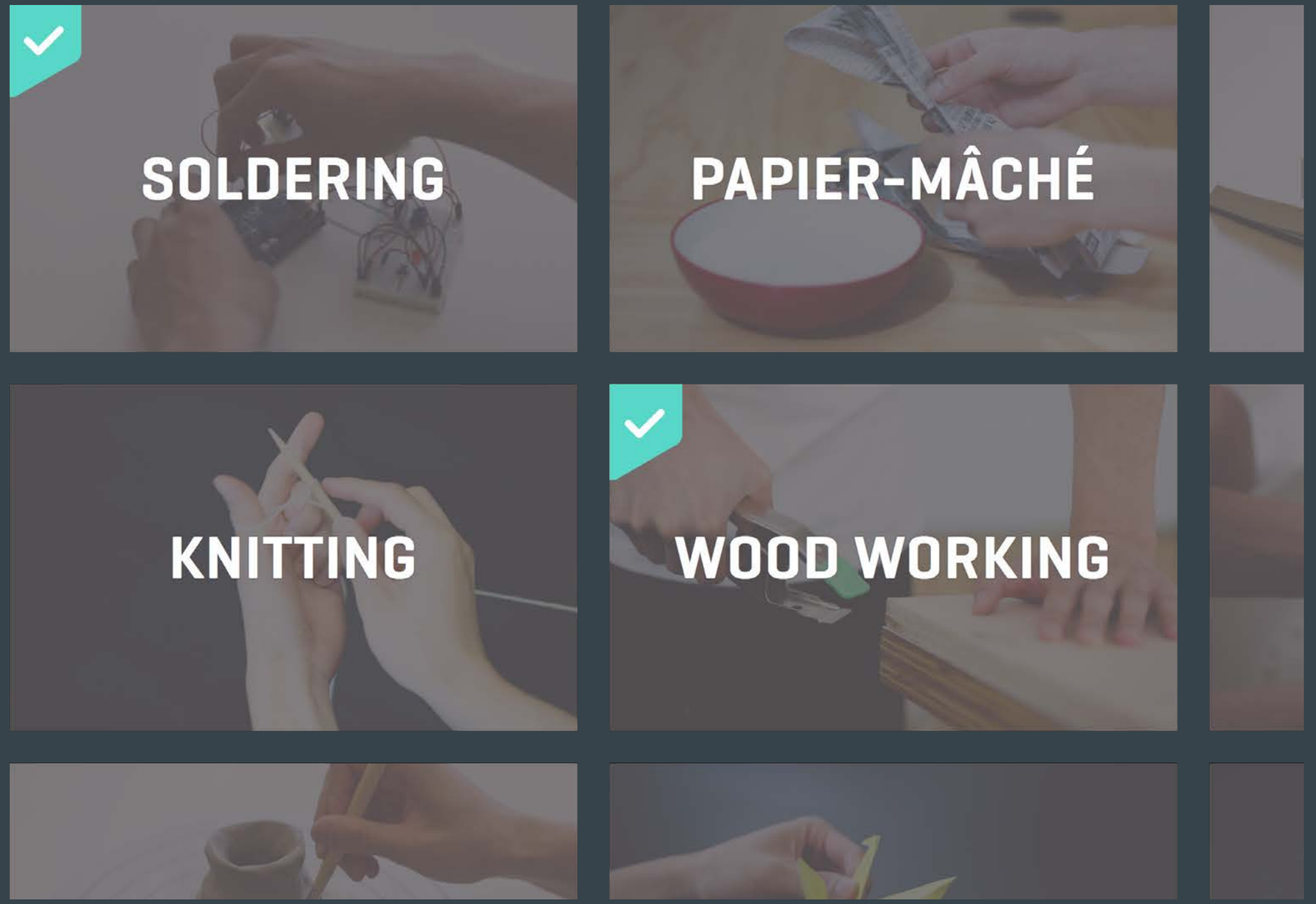


Playback Bar

Additional Details

Additional features that were designed within our scope and time was the profile sign-in and tutorial selection screens.

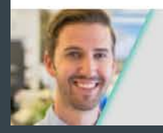




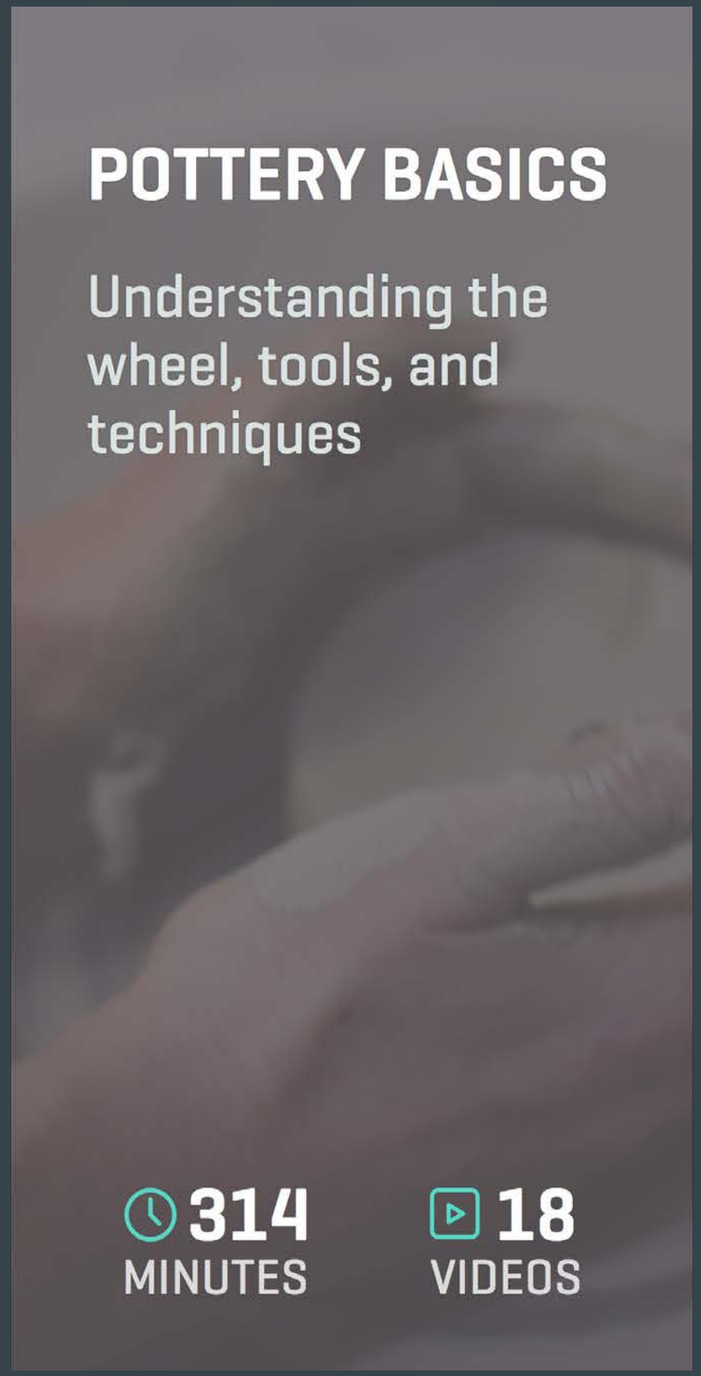
Pottery

Pottery wheel techniques including hand building, sculpting, glazing and firing.

GRID VIEW | LIST VIEW



Jonathan Doe



Final Thoughts

Outcome

Even though our proposed final design is not immediately reproducible, the core principles and components are all available currently. We have developed a human-computer interaction model that shows how voice input can control video playback and how that relates to user context. We also have integrated adaptive learning in ways that allow for different types of learners to thrive and learn effectively. We believe that our system can help all kinds of people learn dexterous hand skills, and not just in the craft space. There is an opportunity for machinist training, medical procedural training, and many other spaces that require the practice of hand skills and the development of muscle memory. We have also found ways to preserve the practice of these skills even more accurately compared to current practices.

This exploration was entirely engaging and satisfying. The last couple weeks of the project was especially stressful yet satisfying. We had taken a small pivot towards the end of the project and switched to pottery as our use case. This was to show the scalability and generality of our solution. However, it was this risk that helped us understand whether our solution would ultimately be effective. In addition, it was just change that allowed us to create a more compelling product video. It showcased a lot of the problems we talked about earlier and showed a real-life scenario of the solution in effect. I felt that as a team we approached the process at the right pace and made sound decisions in terms of next steps and quickly getting our hands dirty.

Our Mottoes:

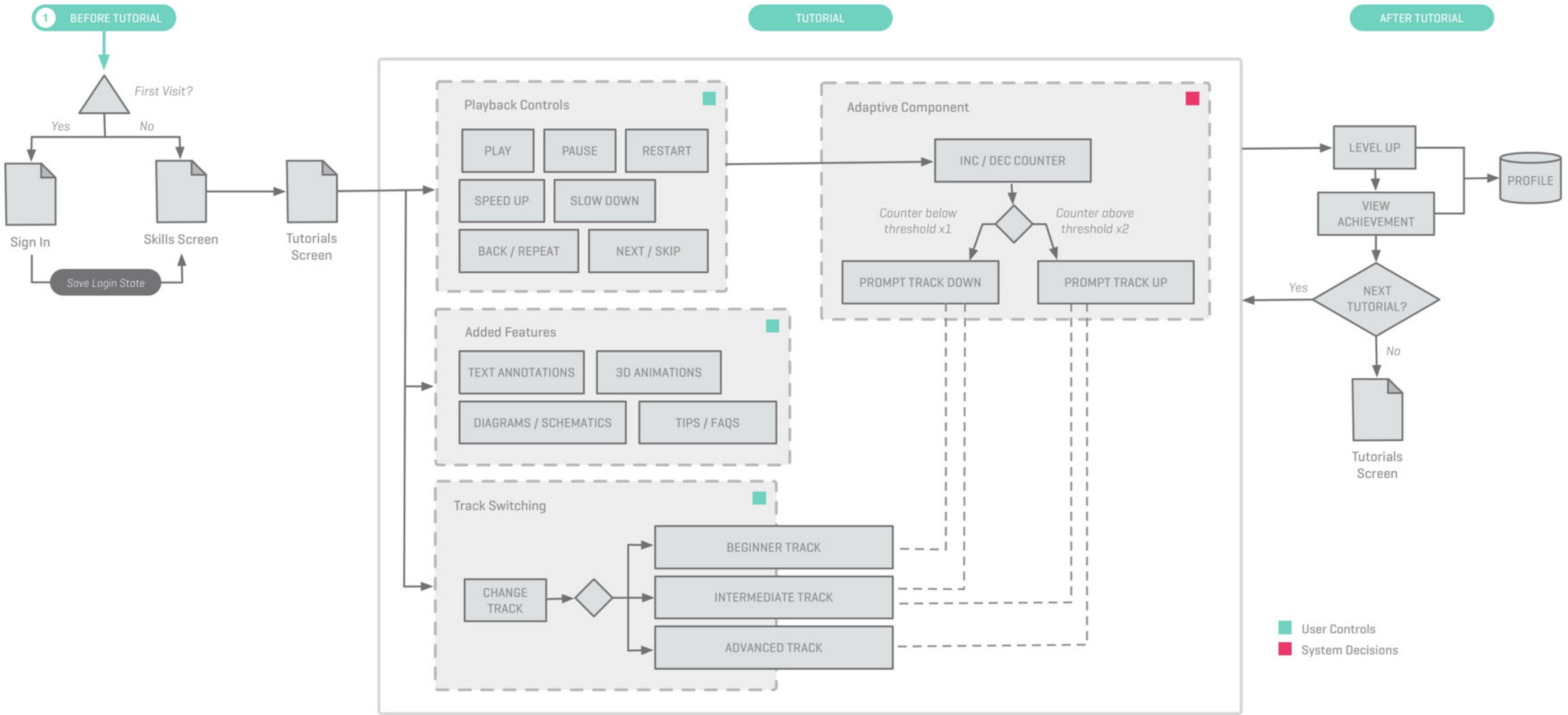
“Just do it!”

“Let’s just try it out.”

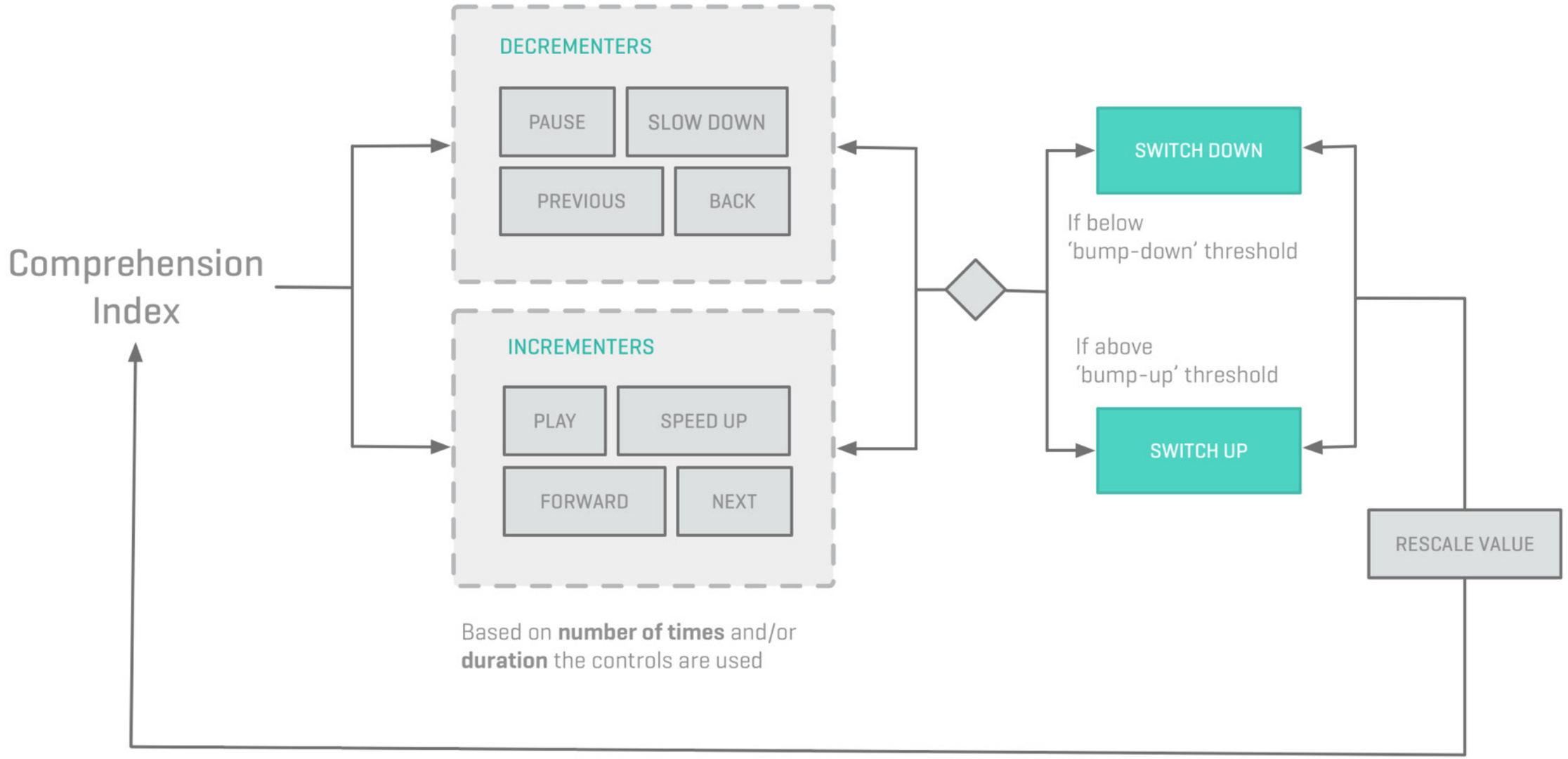
“We’ll learn more if we just go and do it.”

Appendix

System Diagram



Track-Switching Logic



References

All images in this book were produced or captured by members of the team.
Profile images used were either taken by the team or used from websites with permission.