

Team Stakeholders

Trash & Recyclable Separation

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MEETING NOTES

4/26/18

- **PROBLEM:**

- POOR SEPARATION OF TRASH @ UCSD
 - Try to narrow down at Dining halls?

- **DINING HALLS**

- Start to check if each dining hall has 3 separate trash cans (trash, recycle, compost)
- How the trash system differs across the othe dining halls

- **Stakeholders**

- **Primary**
 - UCSD students
- **Secondary**
 - Staff and Faculty
 - Dining hall Employees (HDH employees)
 - Email managers for interviewers
- **Tertiary**
 - Waste facility sorters

- **Structure for interview**

- **Broad questions for HDH employees**
 - How is trash disposed?
 - Are there any concerns for waste?
 - What kinds of materials are reusable/recyclable?
 - Are students utilizing these resources correctly?
 - Consideration of how they serve the food with materials?
 - Why did it work / not work?
- **Broad questions for students**
 - Do you think you are separating your trash efficiently?
 - What's your preference on plastic or reusable plates/utensils?
 - Is recycling important to you?
 - Why / why not?
 - Ask if they know how to recycle their trash?
 - How do you recycle at home?
 - How do you recycle at school?
 -

- **Observing**

- Sit by a trash can in a dining hall and observe how it is used
- Take notes and interview anybody who IMPROPERLY recycles?? This is valuable because what we say is not always what we do, and here we would be capturing what people DO.
- Take some pictures of inside the trash can / AND instructions of how to recycle.
- Relativity of how waste bin fills up vs. the recyclable bin

- **Questionnaire / Quiz**

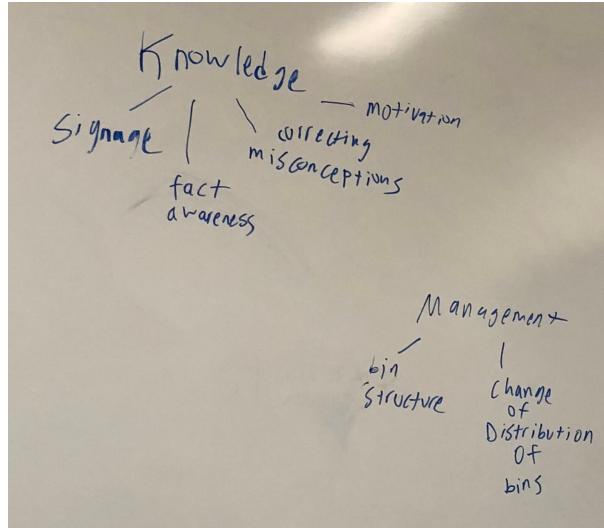
- Create an online quiz later on

- Picture quiz asking if it's recyclable
-
- Ryan and Will are attempting to interview Rachel Smith, student director of energy & waste of student sustainability collective

Will will interview a freshman outside of MUIR and ask them what information/knowledge they have of recycling/proper waste disposal and how they acquired that knowledge, and how better they can be informed or how recycling can be easier for them. Targeting a freshman because they represent the incoming generations of students and their knowledge bases and how much UCSD has informed newcomers.

5/3/18

- **Agenda for today**
 - Go over Affinity Diagram
 - Make any edits to it
 - Talk about which model(s) would be best for our project
- **ALL MEMBERS NEED TO:**
 - Create a persona for stakeholders. Some ideas for personas
 - UCSD Student
 - (different goals or characteristics)
 - Commuter (could have two personas, just diff scenarios) - **Raquel, Will** (lazy person who recycles sometimes but will toss bottles into the trash- this is the person who we need to channel path of least resistance for)
 - Person living on campus -
 - Person who recycles (**Kenny**) vs. one who doesn't and wants to vs. one who doesn't and doesn't care (**Ezekiel**)
 - HDH worker (**Ryan**)
 - HDH upper management
 - Manager (**Kent**)
- **Day in the Life Model?**
 - Trackable recycling bottle or something where you throw it away and you
 - Something that attaches to each piece of trash they throw away
 - Tracks how well they were able to dispose of trash the correct way?
- **From Affinity Diagramming:**



- Signage could possibly tie in facts + correcting misconceptions + motivation
- Potential design projects?
 - Plate / Utensil checkout system
 - Eliminates plastic plates / forks / spoon
 - Allows us to focus on recycling
 - Cans
 - Bottles - Glass / plastic
 - Clear that these aren't negligible
 - Straws
 - Dirty napkins
 - Check out as many plates / utensils as they want, but must return by the end of the quarter or get charged.
 - Problem:
 - To-go orders
 - 10 cents per box?
 - Could fix boxes by making biodegradable
 - Credit sales
 - How to track plates with credit?
 - Is it enough to be important
 - Do these people steal plates?
 - Bring own container / plate

5/10/18

AGENDA FOR TODAY

- Implement design models for design system
- Group analysis of interview / fieldwork
- Visioning session (details of our design?)
- Discuss affinity diagram

WHAT NEEDS TO BE DONE BEFORE 5/11 @ 11PM INDIVIDUALLY:

- **Personas**
- **Interview analysis**

1. Ideation?

- a. **Attachable recyclable bin to the trash can?**
 - i. Easier to remove and take it off
- b. **Special design for the openings of trash cans / recyclables**
 - i. Slit with whole in middle allows plates and bottles only
 - ii. **Downfall:** bigger sized containers won't fit.
- c. **More field research and observation of what they throw away**
- d. **Bin redesign: Utensils**
 - i. Bin for only plastic utensils
 - ii. People would still throw away forks and spoons because they're small so they'd probably throw it away in the trash or recyclable.
 - iii. Same for straws because of the size
 - iv. **Solution:** separate mini can for forks and spoons and straws?
 1. **Problem:** not cost effective to make recyclable plastic utensils
- e. **Possibility of having trash bussed solely by workers**
 - i. Would be able to separate trash in the back properly
 - ii. Friction eliminated (students won't take responsibility for their own actions- so this is a friction that should be left in) and would be put all on staff (bad thing)

2. Sequence model / Visioning Session (also refer to pic below)

- a. Step 1: enter the dining hall
- b. Step 2: decision of which food you want
- c. Step 3: order food
 - i. Two defaults here
 - ii. *Automatically get reusable plates when dining in*
 - iii. *Only gets plastic dishware if person asks for 'to-go'*
- d. Step 4: get dishware / utensils
 - i. Pure reusable dishware
 - ii. Pure plastic
 - iii. Mixed plastic and reusable dishware

- e. Step 5: eat
- f. Step 6: produce waste
 - i. If pure: most likely only napkins
 - ii. If mixed / plastic: utensils, straws, cups, napkins, plates,
- g. Step 7: Head to exit
- h. Step 8: return dish (if applicable) or steal dish lol
- i. Step 9: separate trash from recyclable,
 - i. Properly
 - ii. Poorly: recycle straws / utensils / napkins or throw plates and napkins away.

3. Affinity diagram

a. What did we learn off it

- i. Not strictly about bin setup
- ii. Want to lessen the load of the consumer
- iii. More connections of reducing the need for information to the students (by reducing options of things to dispose of- using reusable dishware instead of recyclables). This will eliminate the friction of educating the young generation of students what is recyclable or not, and this may be a bad friction to eliminate because these people are the next generation of adults in the world and should know what to recycle, but we suggest that this is not UCSD's responsibility because education is difficult because what is recyclable is different for every city and state. Thus it is okay to eliminate this friction.

4. Few question survey

- a. List of recyclable items
 - i. Which is recyclable
 - ii. Dirty napkin
 - iii. Plastic fork, spoon, plate
 - iv. Straws
 - v. Cans & bottles
 - vi. Dirty plastic container (i.e. coffee cup)

Obstacles to implementation of design?

5/17/18

AGENDA:

- **Discuss ideas**
- **Start to design**
- **Finalize ideas / start light prototyping?**

1. From Raquel's meeting interview from HDH

- a. Kosher is important and dishes cannot be used if it touched non kosher stuff.
 - i. Results in having to use plastic at this station
- b. Paper plates are cheap for OVT and plates are biodegradable.
- c. No more food waste bin because one piece of trash can spoil the whole batch
- d. Interviewee recognized that people don't actually read sign.
 - i. For the most part people are pretty okay with it.
- e. For sales:
 - i. 10% people pay with cash/credit
 - ii. 90% use dining dollars
- f. Can refer to Raquel for interview notes

g. TAKEAWAY?

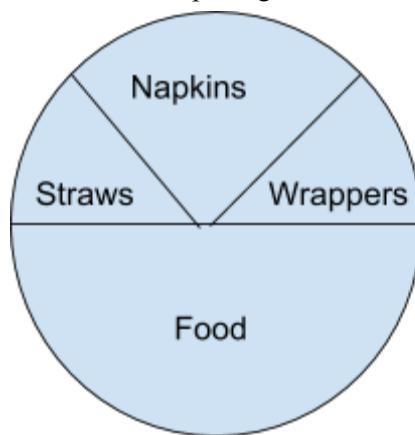
- i. In general HDH is doing pretty well with recycling.

2. OZZI system exists

- a. This is a check out system for plates and utensils.

3. Other possible ideas?

- a. Scrap using plates and just use trays?
- b. Different sized trays
 - i. Big one for getting lots of food
- c. Maximize use of recycling, instead of trash
- d. Make the openings of trash cans smaller (to be used only for actual trash)
 - i. Funnel opening
 - ii. Change the labels to fit the description of what goes in more.
 - iii. Divider of the opening of the trash can with labels of which go where



iv.

4. Next week:

- a. By Monday:
 - i. Storyboards

- b. Come with a prototype
 - i. Small hole/funnel
 - ii. Clear bin/mirror bin
 - iii. Divider, with labels around hole
 - iv. Signage?
 - v. Or come up with new stuff

5/24/18

AGENDA:

- **Plan out prototype design**
- **Set up time with HDH to let us use prototype**
- **Come up with ideations incase our prototype fails**
- **Set goals to accomplish by next meeting**

1. For storyboards

- a. Everyone complete their storyboards
- b. Done by Sunday and uploaded to google drive (5/27)
- c. Ryan will do summary for Storyboard

2. Prototype

- a. Raquel will create prototype.
- b. **Setting up outside**
 - i. Have the big prototype and small prototypes to use
 - ii. Ask stakeholders to use them and collect data

3. Testing on Saturday

- a. **Around afternoon 12 / 1 pm**
- b. **@ Pines**

4. Signage

- a. Better wording on the sign

5. Different names for wholes of Prototype

- a. Food waste
- b. Dirty paper
- c. Straws / utensils
- d. Wrappers / bags

6. MILESTONE 3 GOALS

- a. Ryan will work on → Storyboard summary
- b. Kenny will work on → Prototype summary
- c. Ezekiel will work on → Prototype testing summary

7. Kenny's idea

- a. Guiding tool interacting with diagram to the trash can
- b. Stickers leading to the whole

PROCESS PHOTOS

Field Notes

OBSERVATION DATA

-A girl walked up to the trash can, was about to throw aah cup in trash
-stopped and read sign and threw it in recycle

-A girl was about to throw away sushi tray but stopped, then emptied out the trash inside (napkins) into the trash bin
-threw away the sushi into recycling bin

-Said it didn't help because it's going to same place
-but only had food scraps
-would be better if divide was better made

Napkins in recycling bin
Soiled paper towels
Soiled paper trays (mini cardboard one)

In landfill:
-black plastic recyclable bowls

People eating in dining halls:

-people who dined in that had plastic ware mainly had:
->curry bowl
-> salad

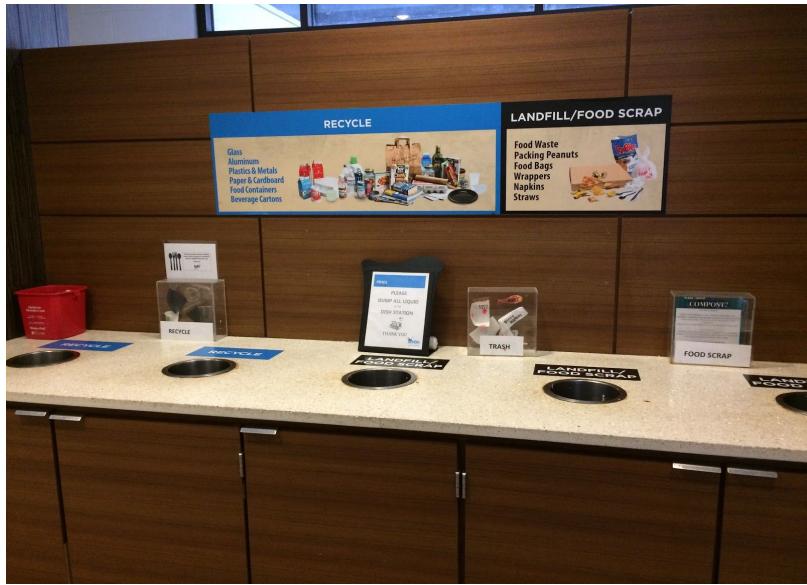
Others mainly had reusable dish with occasional non hard plastic cup



Field site photos







We



Field Research

In order to develop a greater understanding of the needs of our stakeholders and the context in which our design problem exists, we conducted field research at different locations across campus, most notably in the dining halls which became our eventual focus for the project. Some aspects that were specifically examined in order to provide information about how the systems work in different areas on campus include the physical attributes of trash/recycling receptacles, the presentation of signage, the distribution of bins, the contents of the bins, and notable behaviors that users exhibited when throwing away their trash or recyclables.

Pines Dining Hall

The following images depict the contents of the trash and recycling bins in Pines Dining hall. While each bin seems to represent a loose categorical trend in how they are sorted, a number of incorrectly sorted items make up the contents of each bin.



L: Recycling, R: Trash

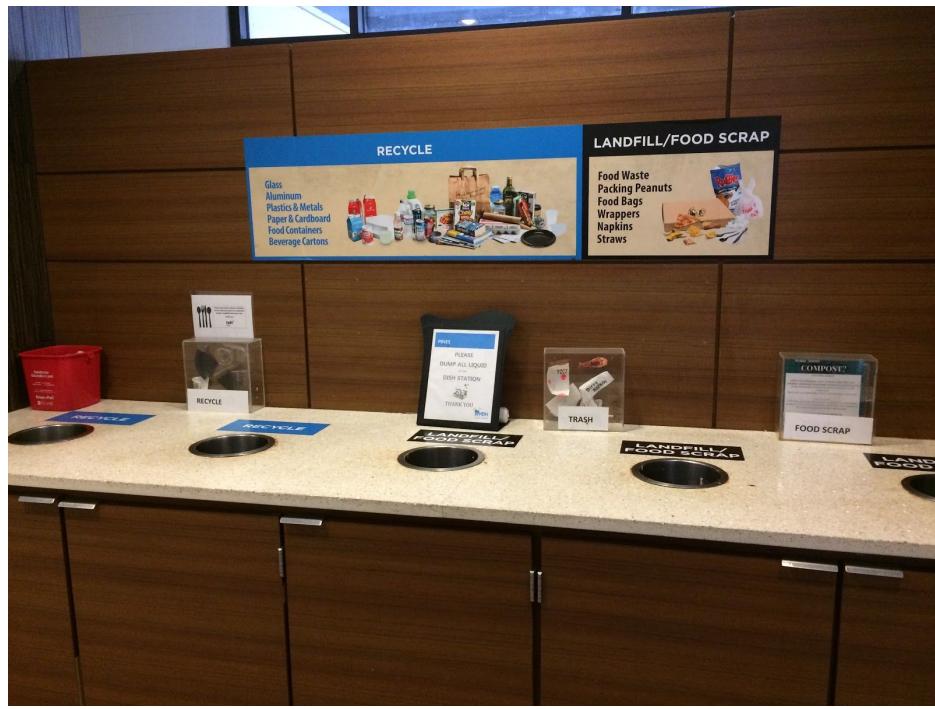


L: Recycling, R: Trash



L: Recycling, R: Trash

The trash area at Pines features signs hung on the wall behind the trash holes. Two recycling holes and three trash holes are distributed across the area. Display areas and various signage are also present:



Interviews

Consent Form Copies

A1230SS12

Researcher's PID number

Consent to Participate in Research—Formal Interview and Recording

Cognitive Science Coursework: 102C Cognitive Design Studio

Raquel Davis (researcher's name) is conducting research to discover aspects of everyday cognition—how people think, talk, and behave, as well as aspects of interaction with the material and sociotechnical world—how people engage with environments, artifacts, tools, and technology.

The purpose of this study is to give the student named above an opportunity to practice the skills of cognitive and contextual design by conducting on-site observations, conducting interviews, and taking notes on these observed activities to inform the formulation of design questions, and insight into possible design solutions.

With your consent, the researcher will conduct an interview with you. The student may make an audio recording of the interview, and if so, will notify you of such. You may refuse to answer questions and you may terminate the interview at any time. The interview time will vary, but the researcher will inform you of the approximate time, and is based on your consent. The audio recording may be heard and the transcript, or analysis may be seen by instructors or other students in the course. However, the researcher will make every effort to maintain your anonymity.

Participation in this study may involve some risks or discomforts. These include:

A potential loss of confidentiality. Your name will not appear in notes or transcripts. If the notes or transcripts are seen by instructors or other students in the class, your name will not be available to readers.

The student researcher has been instructed to NOT discuss illegal activities.

If the interview or other aspect of data gathering makes you uncomfortable, you may terminate participation at any time at no risk.

There may be some unknown risks that are currently unforeseeable. However the student researcher will make every effort to avoid risks and discomforts.

There will be no direct benefit to you for participating in this study. You will receive no compensation for participating. The researcher may benefit by learning about the nature of everyday cognition.

Participation in this research is entirely voluntary. You may refuse to participate, withdraw, or refuse to answer specific questions at any time without penalty. There will be no cost to you for participating in this study.

The student researcher named above has explained this study to you and answered your questions. If you have other questions about this research, you may contact Dr. Taylor Scott at tjscott@ucsd.edu.


Participant's signature

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5-17-18

Date

Consent to Participate in Research—Informal Interview and Note-taking

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Participant's signature

4/22/18

Date

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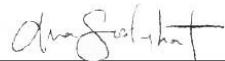
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Participant's signature

5/10/18

Date

Interview Notes

Bistro Worker Interview

Questions:

- Do you often recycle when at work, and is it easier or harder than in your personal life?
- To what extent do the systems for recycling work?
- Are there any big problems you face when trying to take out the recycling?
- What are your suggestions for improvements on these systems?

Notes

- Does both serving and bussing, as well as some occasional dish work
- Recycling in this space can be difficult because they often don't know what to do
 - Know that they can throw a paper wrapper in the recycling
 - Not sure what to do once that wrapper has become soiled
- Same for things such as cardboard and plastic containers
- Instead of trying to look up the information, which isn't clear via signage, it's easier to just toss the item in the trash
 - Most people are not like them and throw anything possibly recyclable into the recycle bin.
 - This makes the bins gross and contaminated
 - When it comes time to take out the trash and recycling, they throw it all into the trash dumpster instead of choosing to filter out each of the pieces by hand
 - Thanks to a new policy implementation on campus, plastic bags are not recyclable through the systems used on campus
 - Cans for recycling are not given a plastic liner
 - The ones responsible for replacing the liners can fail to follow the policy and place one in the recycling anyway
 - That batch makes its way into the trash
 - The recycling bins are small and never taken out regularly
 - Once filled, the remaining recyclables are thrown away
 - No one is held accountable for what they toss into the bins
 - No motivation to do it properly
 - Only people who see what gets thrown out or recycled are the ones taking out the trash at the end of the night
 - More interested in saving time and going home than saving the environment
 - More oversight and accountability for the workers to get these systems working

- On the bins implemented in OVT:
 - Why are there more recycle bins than trash bins?
 - Why isn't there a food waste bin?
 - Do you think there should be other bins for different items?
 - What is the rate at which the contents of the recycling bins end up in the trash?
 - Have there been changes in the types of bins that exist?
 - Are the bags for the recycling bin recyclable?
- On the signage and informing people:
 - How effective are the signs at informing people what items go in which bins?
 - What items from OVT go into which bins?
 - How good are students at determining which items are recyclable?
 - How up to date are the signs?
 - Have there been updates in the types of plates used at OVT?
 - How prominent are the signs for each bin?
 - How much information is in each sign to inform the user to use a particular bin?
 - Are the signs accessible to all people?
- On the cutlery/plates used in OVT:
 - Why did you choose the specific types of plates for what you serve at OVT?
 - What reason would you have for not implementing ceramic dishware? If you were to bring back ceramic dishware, how would you prevent losses? Would you be interested in using ceramics?
 - Is the plastic silverware recyclable? Is there recyclable silverware? Would you implement it if there was? What would make it viable?
 - Are your to-go containers different than the ones you normally use for foods like pizza or the specials?
- On types of sales:
 - What are the proportions of people paying with cash or credit versus using dining dollars/Triton Cash?

10% cash/credit

GLATT cert

90% return

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\$1000's chira

- ↳ water usage
- ↳ stden
- ↳ splo station
- ↳ kosher

trash recyclable disposable vs reusable

26ms recycle to encourage
+ spacing

2.5/3 k student

beginning of year

pizza plate

Ozzi-boxes (reusable)

- ↳ token → ozzi-box → to lean back
(bar code)

recyclable grade utensils

too small for hands/hi

back of house v good

↳ Compost - 70/90% → handl handled

↳ Kevally for serving up

front of house

↳ educate via economy to compost

↳ haulers sort the recycling @ plant
(2 trucks)

lose Person
recd feedback in M52
photo nicely found

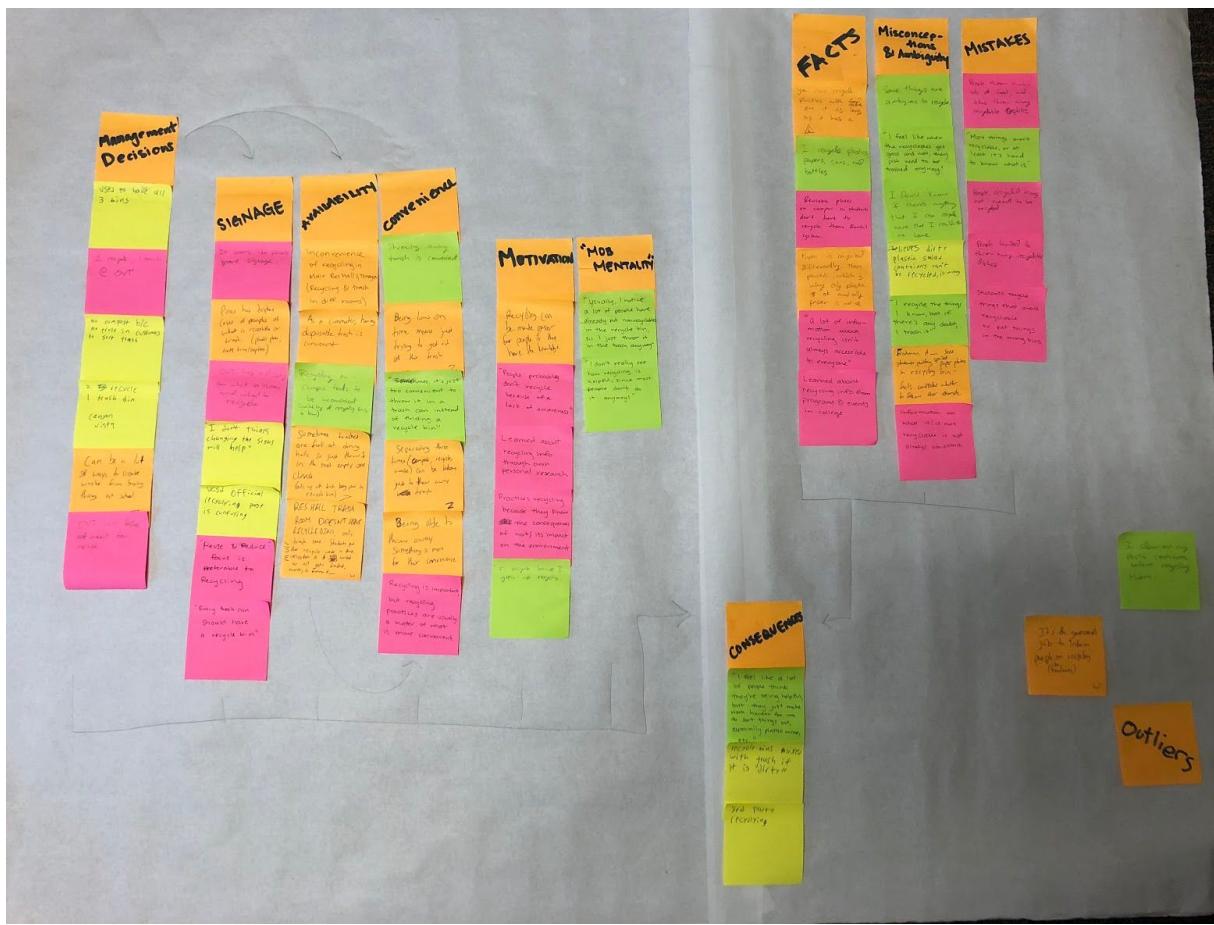
Interview with Ava S. (5/10/2018)

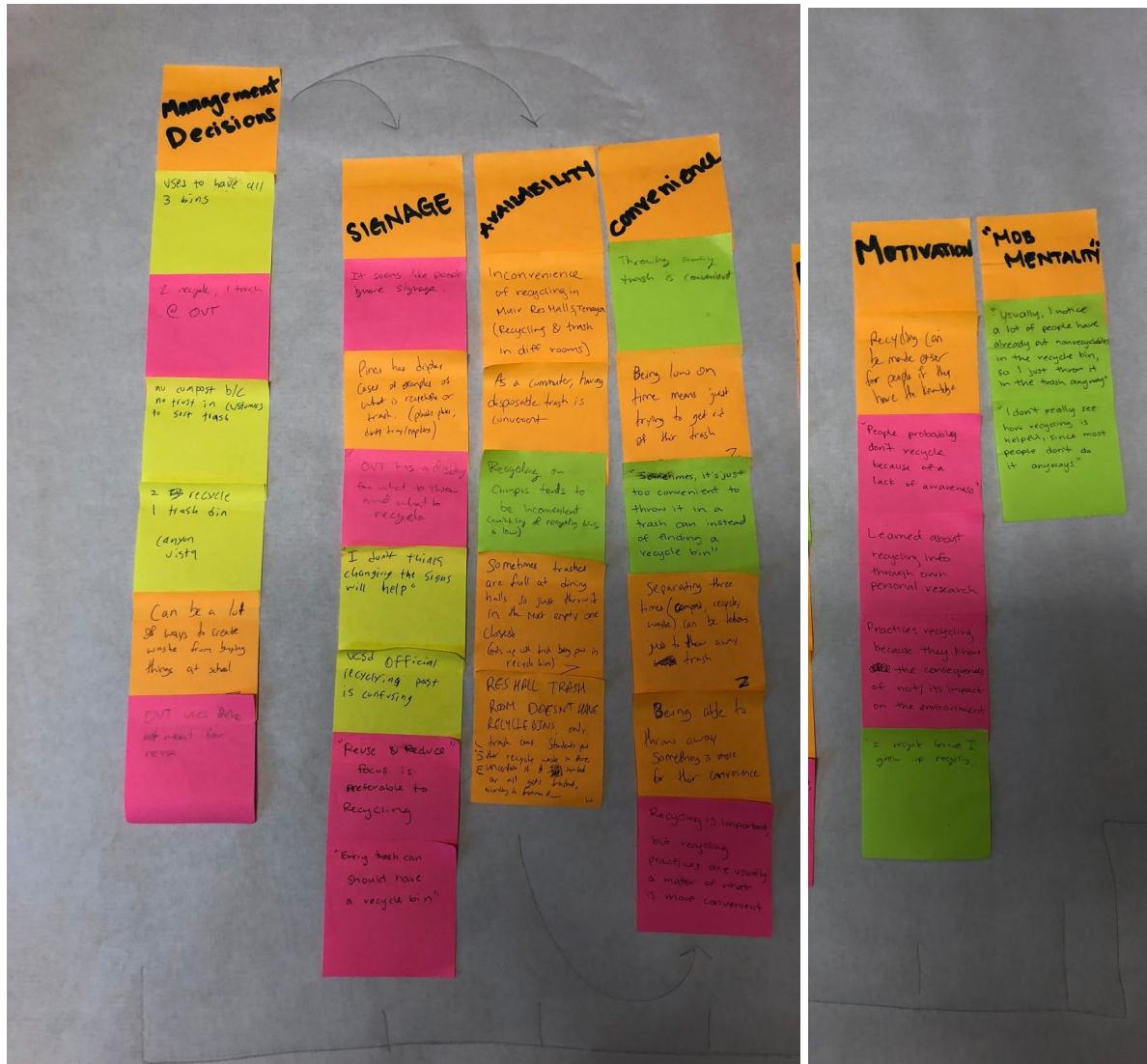
- Commuter Student off-campus, student leadership experience
- Describe your recycling habits
 - Don't always practice
 - No recycling bins at home
 - Don't know a lot about recycling
 - Really bad
 - Knows how important it is
- Is there any reason why you don't participate in recycling/trash sorting?
 - Convenience, no available bins
 - Don't know a lot about it, but says they should

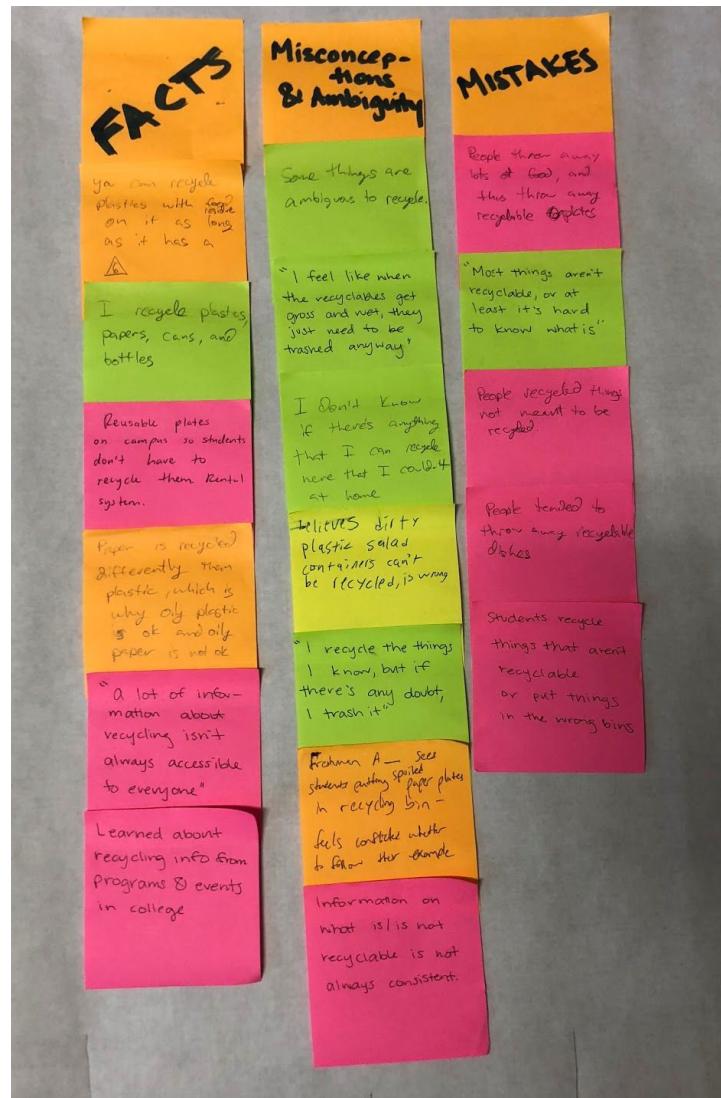
Interview with Claudia C. (4/22/2018)

- What sustainability practices do you typically partake in?
 - Recycle
 - EVERY TIME RECYCLABLE
 - Valid
 - Carpool when able to
 - Use a refillable water bottle
- What things have you done to learn more about sustainability?
 - SUSTAINABILITY EVENTS
 - ECONAUTS
 - Mainly through personal research
 - As a community leader, tries to share ideas of sustainability that you might work with
 - In residential area, have own sustainability pledge and do own sustainability programs
- What factors do you think contribute to whether people recycle or not?
 - Convenience
 - People can be lazy
 - Having easy access is important
 - Whether or not people are knowledgeable

Affinity Diagramming







Design Models

Personas

HDH Dining Hall Worker



"I like the people here, but sometimes I'm just bored."

Age: 19
Work: Busser
Family: Single
Location: La Jolla, CA
Character: Personable

Personality

Introvert	Extrovert
Thinking	Feeling
Sensing	Intuition
Judging	Perceiving

Goals

- Make enough money to help pay for college.
- Get promoted to a higher position, possibly even managing.
- Spend time with people who are like me.

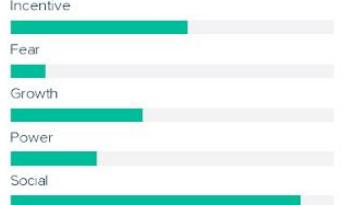
Frustrations

- Work can be boring and uneventful.
- Student leave trash all over the table, making my job harder.
- It's hard to know what trash goes where, so I just end up throwing it all away.

Bio

This busser at Sixty-Four Degrees dining hall on campus is a sophomore at UCSD in hopes of making enough money to pay for at least part of his college tuition, but that is essentially his only motivation to do well. The job itself is quite boring, and if it weren't for the great people he works with, he probably wouldn't stay for long. There's always the change of moving up and having a nicer position, but with his work ethic, it doesn't seem like a possibility any time soon. He wishes at times that management would do something to make it a little easier for him to get things done quickly, so that he doesn't have to be so lazy and ignore tasks. His main peeves: the inefficiency of carrying plates back and forth and the annoyance of excess trash on the tables.

Motivation



Motivation Type	Level
Incentive	High
Fear	Low
Growth	Medium
Power	Medium
Social	Very High

Dining Hall Location



Quality of Work



Task	Quality Level
Cleaning Tables	Medium-High
Clearing Dishes	Medium-High
Separating Trash	Low
Dealing with Customers	Very High

Saylor Tcott



"Sometimes school makes me feel I apart, down to my core, but I pick myself though"

Age: 19
School: UCSD
Year: 2nd
College: Muir
Major: Structural Engineer
Housing: On-campus

Personality



Goals

- Gain experience through internships
- Attain a renowned position in the engineer field
- Life goal of creating a music album

Frustrations about Dining Halls

- Long lines during rush hours (i.e. lunch time)
- Trash cans overflow occasionally
- Signage for Dining halls trash cans not efficient enough

Bio

Saylor Tcott is a student who often eats at dining halls for two of his three meals. Living on campus, he does not see the need to actually separate his trash when throwing it away. He'll throw all of his trash into the bin that is most convenient for him. Saylor also has little info of what can be recycled and what cannot and ultimately leads him to just throwing everything in the trash.

Remember - you may modify this template, remove any of the modules or add new ones for your own purpose.

Motivation

Recycle trash into correct bin

Throw trash into correct bin

School

Self-Growth

Favorite Dining Halls



Julia Amrein

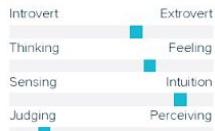
Xtensio



"People just can't imagine what a clean world looks like. But my dream will be their reality one day."

Age: 21
Work: Student, Blogger
Family: Single
Location: La Jolla
Character: Headstrong, instinctual

Personality



Minimalist Eco-conscious Vegetarian

Goals

- To not regret anything she does in her life.
- Experience life to its fullest.
- To be an amazing world travelling blogger.

Frustrations

- Hates to see waste
- Hates not doing anything about other people wasting, but knowing that she tries to tell people will probably be forgotten in the next hour or so
- Wishes that she had enough influence over people to be as conscious as she is
- Frustrated that litter laws aren't well enforced, even though the viability of enforcing litter laws is near impossible with the current system
- The system

Bio

Julia Amrein is an aspiring minimalist blogger who is doing her best to draw an audience while majoring in political science at the university she goes to. She was born and raised to American/Czech parents in Switzerland until her teenage years, at which point she moved to Michigan until she was accepted at UCSD as an out-of-state student. She wants to use her degree to try to influence policy regarding waste and waste prevention. Her dream job is working as the director of the EPA and making America clean again. Her blog is filled with minimalist lifestyle tips, policies she thinks need more work on in California, challenges she's working on, and DIY tips for living up to the "Reuse" part of "Reduce, reuse, recycle".

She joined the CALPIRG UCSD group in order to try to get a foot in the door for applying for an internship at a California congressperson, so she can get some vertical mobility towards her dream job.

She finds herself eating on campus sometimes, only because she's really busy with her own work, and cooking is really hard for her. She doesn't really know how, and she rarely has ingredients ready.

Motivation



Dining Halls



Influences



Don Hancho

Xtensio



"If it's better, do it"

Age: 40

Work: 64 Degrees Manager

Family: Married, kids, etc.

Location: UCSD

Character: Type

Personality



Goals

- Distribute/assign work in the dining hall
- Create a system that is efficient and easy to learn for newbies.
- Earn and save money

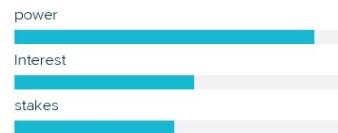
Frustrations

- Have to change garbage system to accommodate poor separation of trash by students
- Losing money from being unable to recycle or compost as much

Bio

I have worked at the UCSD dining halls for 7 years now. I was promoted to manager at the new 64 Degrees dining hall 4 years ago. I am motivated to do my best as manager and do everything I can to make it the best dining hall on campus. Through out the years I've made several changes to the dining hall in an attempt to improve it, some better than others. I am open to critique by the students.

Project Stats



Frequented Dining Area



Ashley Katchem



"I'd do basically anything to save some turtles!"

Age: 20

Residence: On-Campus Apartment

College: UC San Diego, Muir

Occupation: Student

Personality



Goals

- To cut down on personal waste production
- To learn how to recycle effectively
- To make a reduced impact on environment

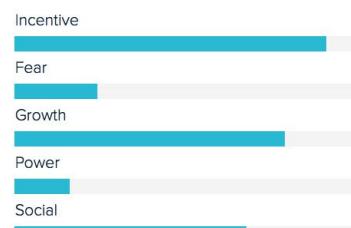
Frustrations

- Understanding recycling information is inaccessible and inconsistent
- Difficult to be sustainable when dining systems aren't sustainable
- Being less wasteful is sometimes inconvenient

Bio

Ashley frequents the dining halls every other day or so. She has lived on campus for two years and has developed a passion for environmental consciousness, after spending time learning about the consequences of waste production. She is outspoken about her efforts in becoming more sustainable and often makes changes to her lifestyle in order to be greener, including cutting out meat from her diet and exclusively using reusable water bottles and bags. She does a lot of her own research when it comes to these efforts and is frustrated that others don't participate because of a lack of awareness and inaccessibility to information.

Motivation



Frequent Dining Areas

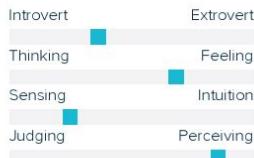




"Yeah, I'm a pretty happy person, not a lot bothers me."

Age: 21
School: UCSD
Status: Single
Location: La Jolla
Major: Computer Science

Personality



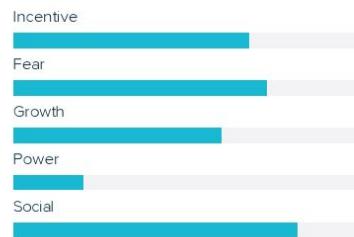
Goals

- Design AI, maybe brain-computer interfaces
- Do something that he is good at, makes him feel skilled
- Aim upwardly-mobile but not so pretentiously as to stand out

Frustrations

- Hates to stand out and be seen as a immoral person. Will be more conscious of recycling if other people are nearby.
- Spends a lot of mental energy considering whether this one girl likes him or not, and what he should do
- occasionally complains about always being busy, never having enough time, yet spends at least three hours cumulative daily on Facebook and Youtube, twenty minutes here & there.

Motivation



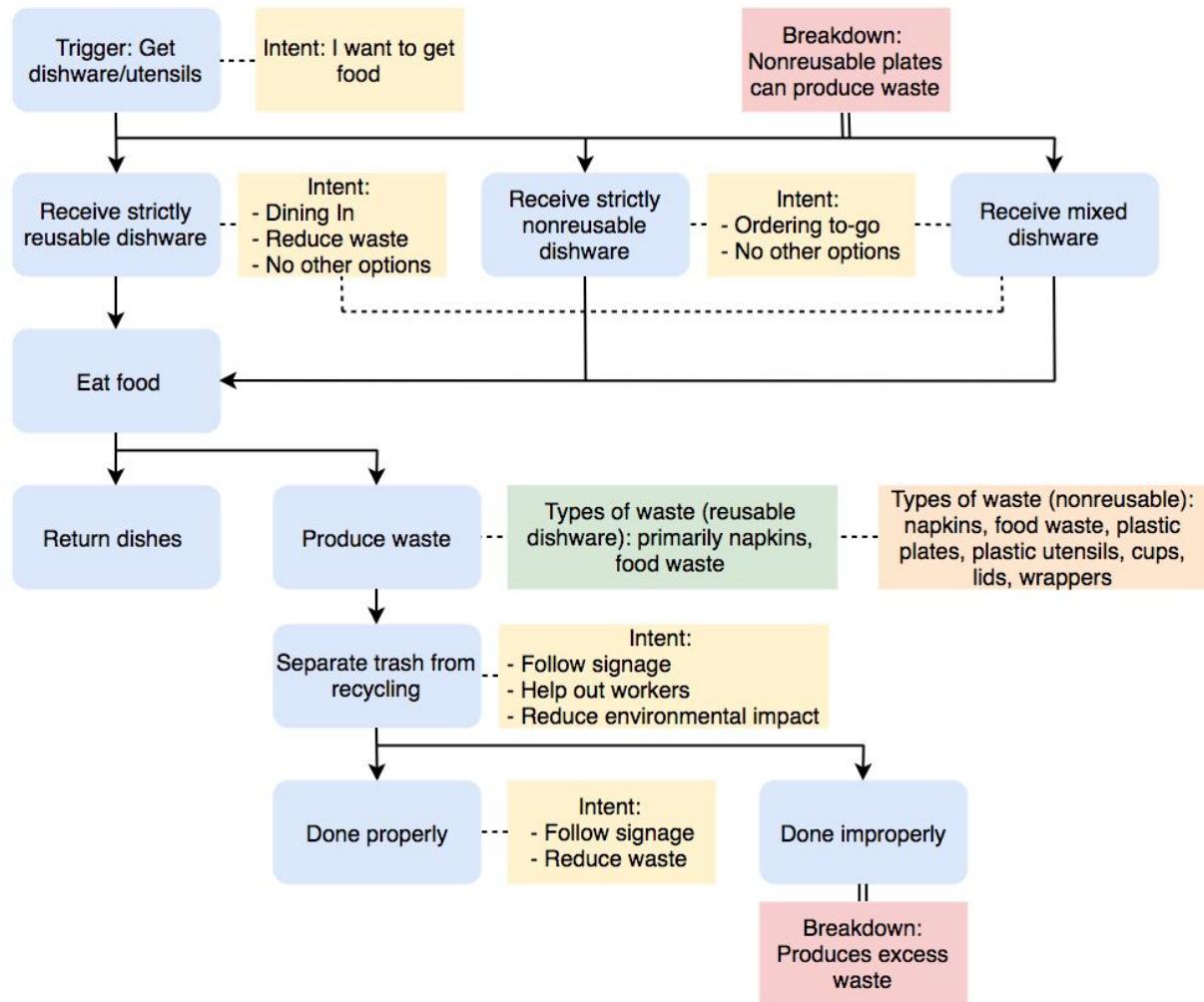
Favorite Dining Halls



Bio

Like many upper-tier university students, Gerald has had a privileged life and had many things given to him. As a result, he lacks initiative and is rather lazy in his personal life, although he works very hard and chugs along diligently as long as somebody sets him down on the right track. He regards recycling and waste disposal like most other things in his life (besides career) - he doesn't really care too much. As a result, he casually flips his bottles into trash bins instead of recycling bins, drops his plastic plate and other waste into "Landfill" trash disposal as long as he isn't with his friends. If he's with his friends, he'll be cautious and do as they do: recycle. In order to encourage Gerald to recycle in his daily life, it is a good idea not to just educate or lecture to him, but to channel the path of least resistance or manipulate/simplify his environment so that the natural decision for him is to recycle and dispose properly.

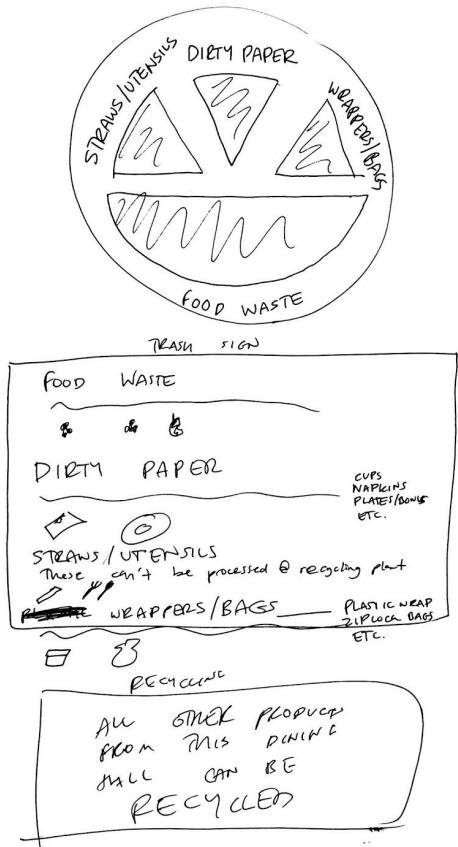
Sequence Model



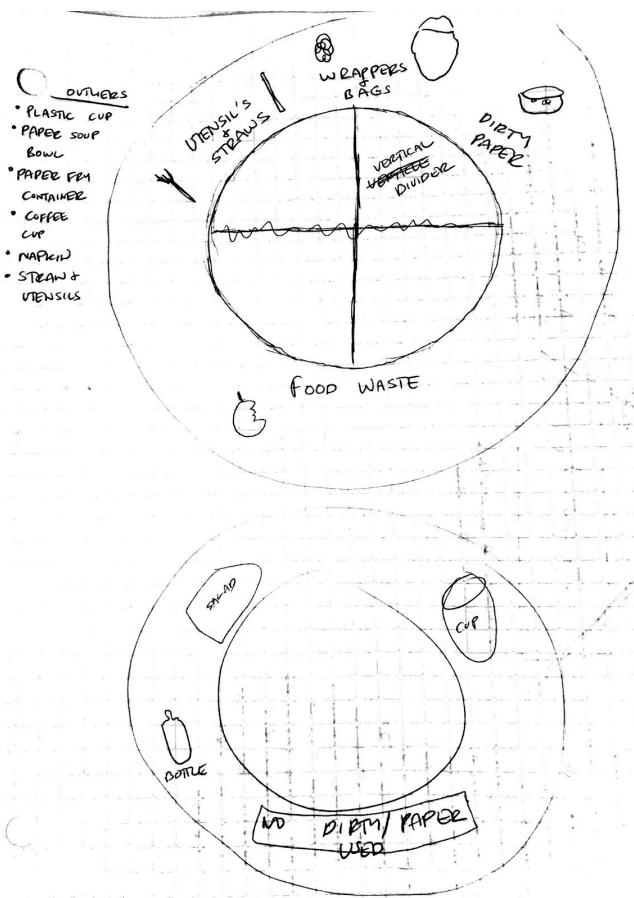
Our group decided to use a sequence model to capture the steps taken when getting food and using dishware at the dining halls. We felt that this design model was appropriate for the design problem we are looking at, as our project seems to center around the sequence of getting food, using reusable or non-reusable dishware, and creating waste. In creating this model, we hoped to be able to highlight some of the areas of improvement in the current sequence in the dining hall and see which steps experience breakdowns. As a result, we want to be able to explore potential design ideas that eliminate some of these breakdowns and create a system that enhances the dining experience in a sustainable manner.

Sketches

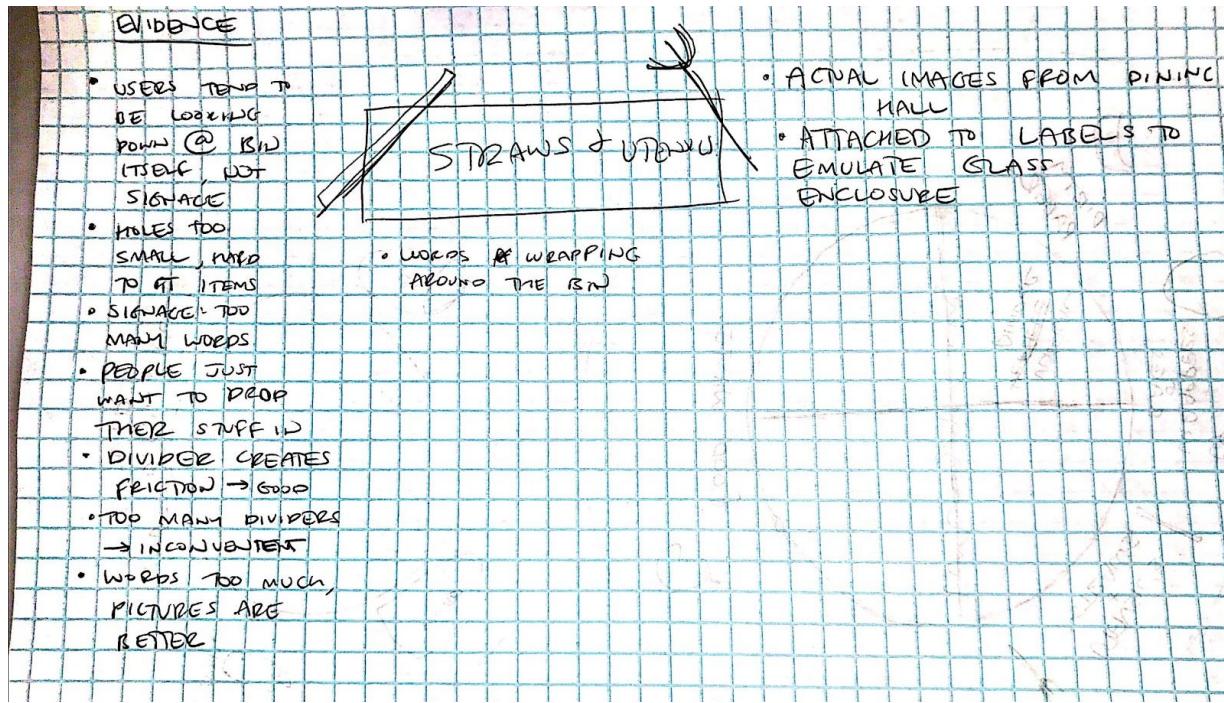
(a)



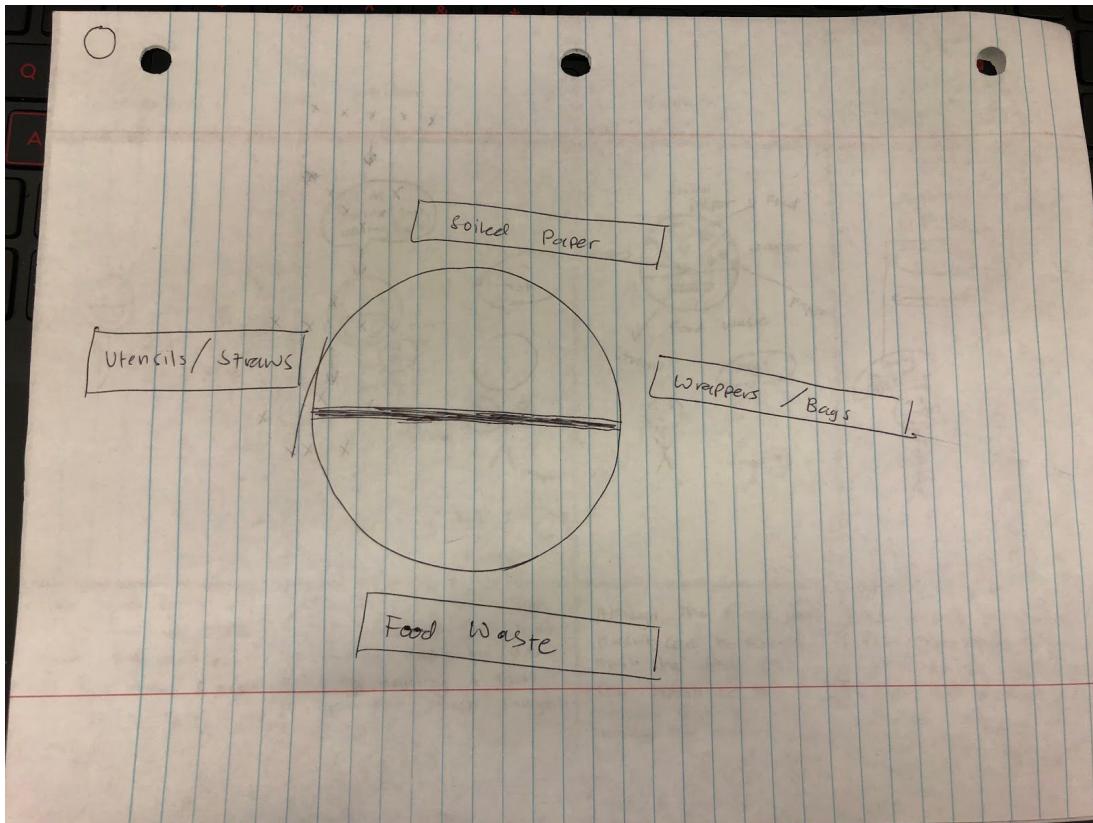
(b)



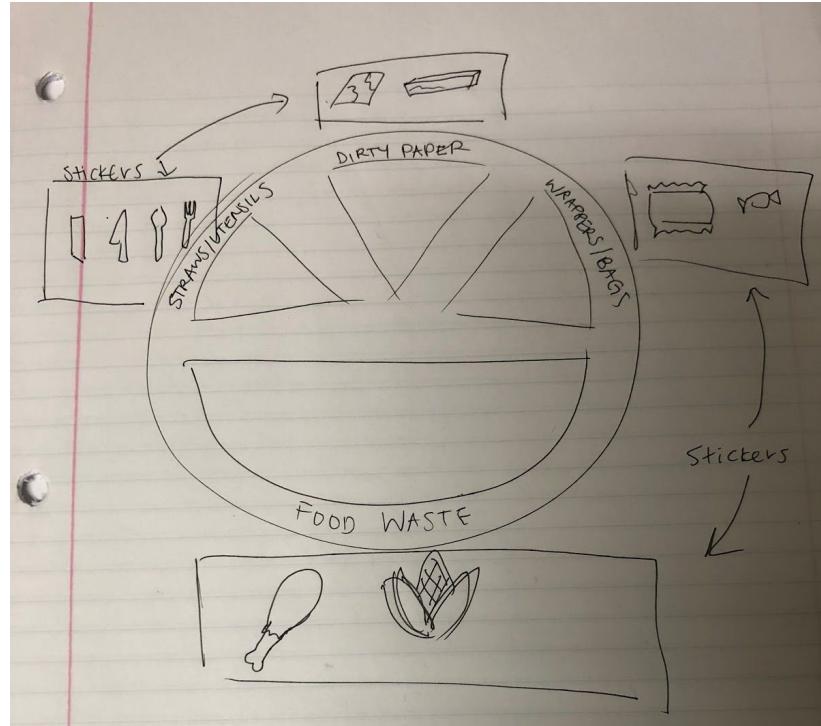
(c)



Above, we can see two iterations of the divided trash bin receptacle (a) and (b), as well as a list of evidence (c) from user testing of the first iteration that led to the development of the second iteration. The main problem with the original design was that the holes were too small for many items, so some students just got frustrated and threw the items into a different trash can instead of shoving them down the holes. However, the dividers did still provide a good amount of friction that caused the students to stop and think about where they'd be throwing their items. This is why we decided to keep a single divider, but focus mainly on the signage being down on the bin itself, as many would not look up at the signs posted on the wall. Our ideas for on-bin signage ranged from pictures to small items attached around the rim, all the way to a small, clear enclosure around the rim to display actual items much like the existing ones on the wall.

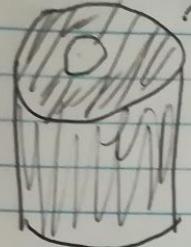


In this sketch we tried to create less friction for our stakeholders by actually only dividing the hole in half. One half of the section would contain all the physical trash, making the whole bigger and easier to use. The other half of the whole would be dedicated for food waste to give a bigger way to scoop the food in the hole.



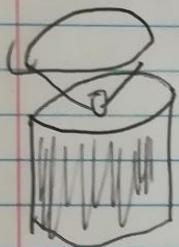
This sketch is one of the first depicting our first actionable prototype that was later created and implemented in the dining hall. One of the main concerns we later discovered in this prototype was the usability of the sizes of the holes. While in the sketch the design seems rather robust, we learned in our actual implementation that some of these translations between idea and implementation are not as straightforward. Still, this idea laid the foundation for our later prototype solutions.

initial prototypes



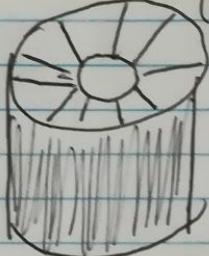
Very small hole
(fits napkins, utensils
and wrappers)

vs

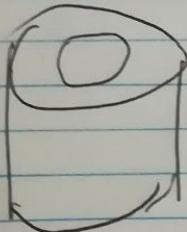


extended
funnel

(trash cans)



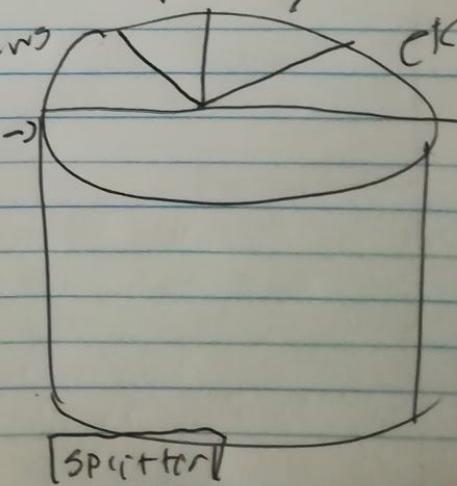
funnel hole
(slightly bigger)



Clear recycle bin

napkins

etc. wraps



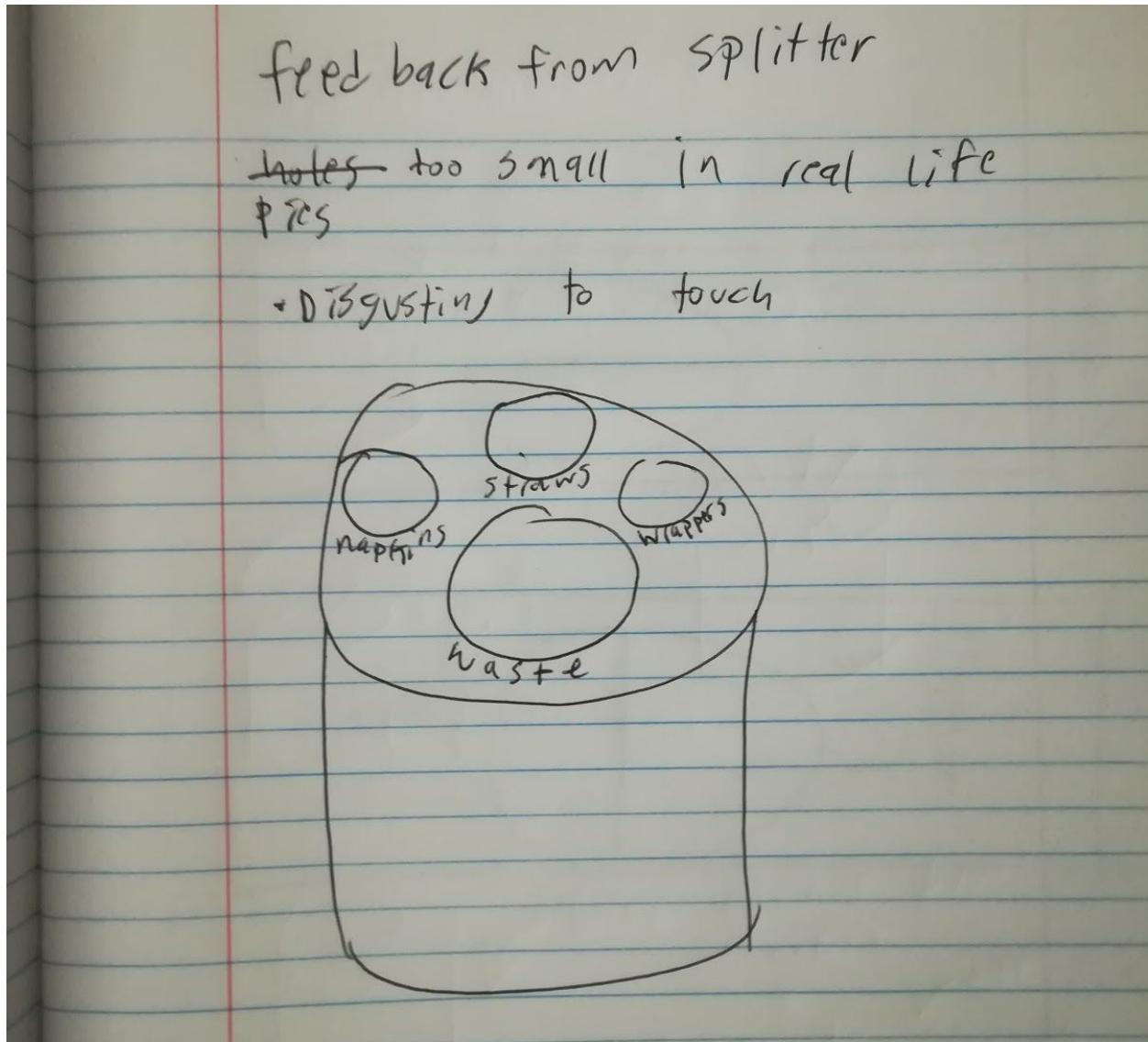
straws
food
waste ->

CK

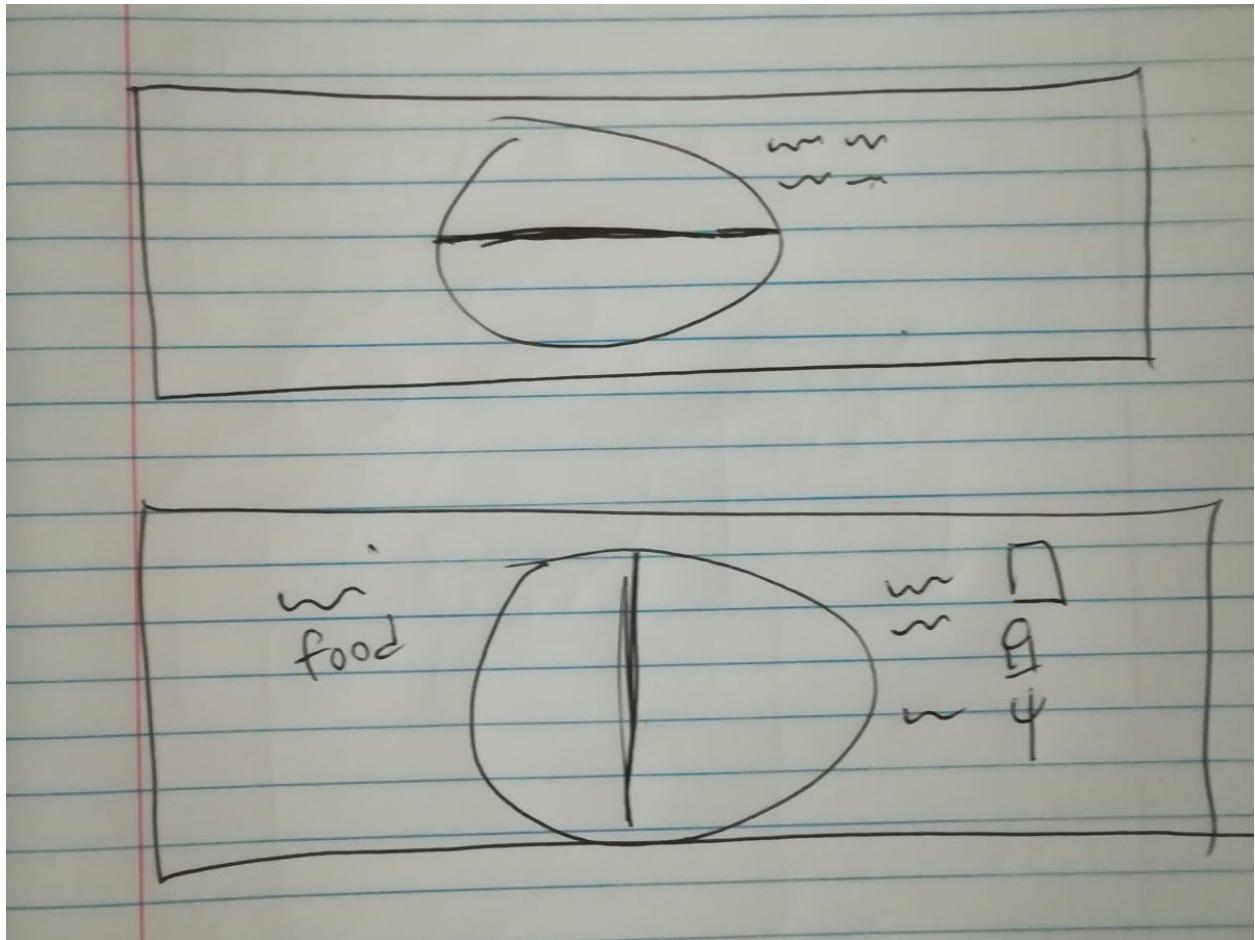
[spitter]

Some of our initial designs that focused on creating friction in order to slow people down or physically/psychologically reinforce some separation of trash and recyclables. For example, the small hole trash bin only allows utensils, wrappers and napkins by virtue of its size. We believed simply having this would naturally guide every other item(which we thought to be recyclable) to

the recycling. The clear bin idea was based the mob mentality we observed and the third part company's sorting system. We aimed to get as many items into recycling bins as possible as more things are mistakenly trashed than recycled.



This was a variation of the original splitter design after the first prototype testing. The goal was to increase the ease of throwing objects by using circles instead of pie cuts.

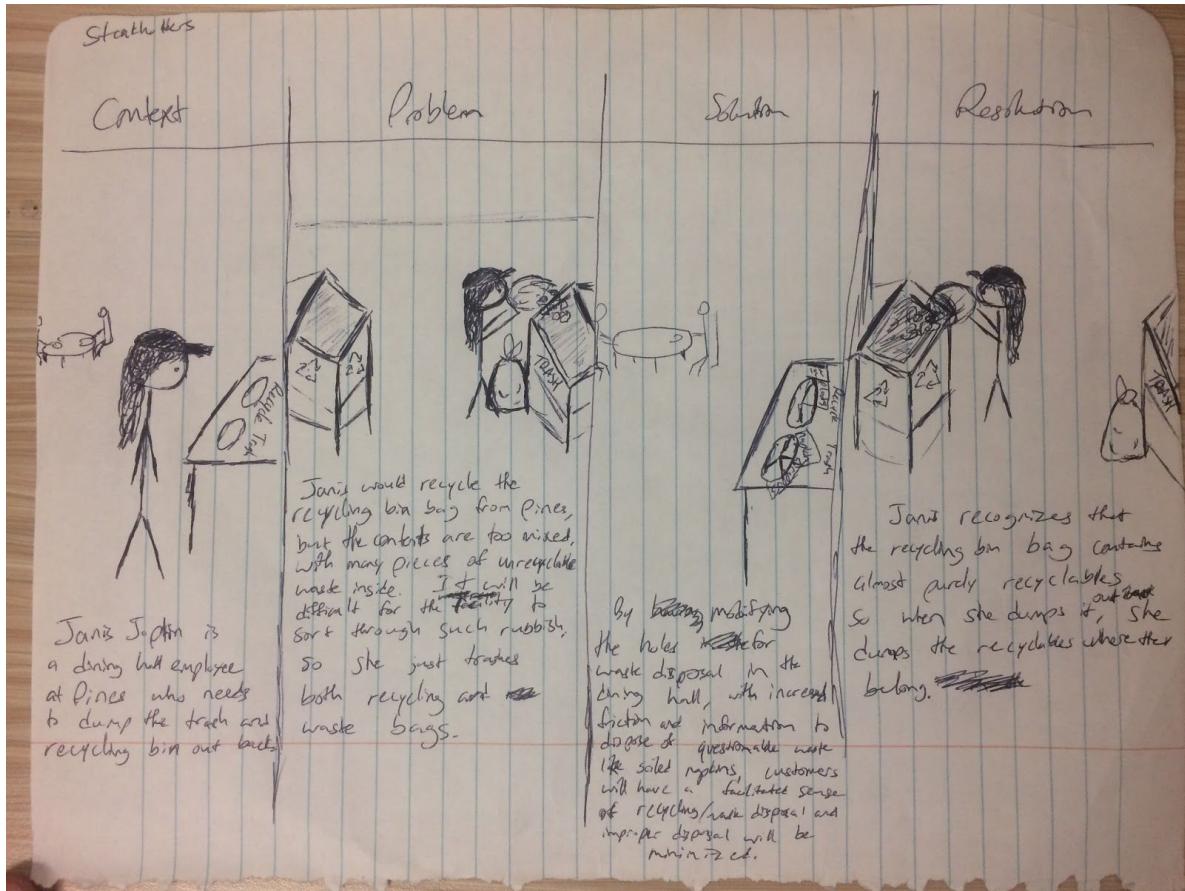


Ultimately, we drilled down to a single divider (vertical because it easier to throw things and align text) because we realized all we really needed was to introduce friction and some well placed signs by the bin.

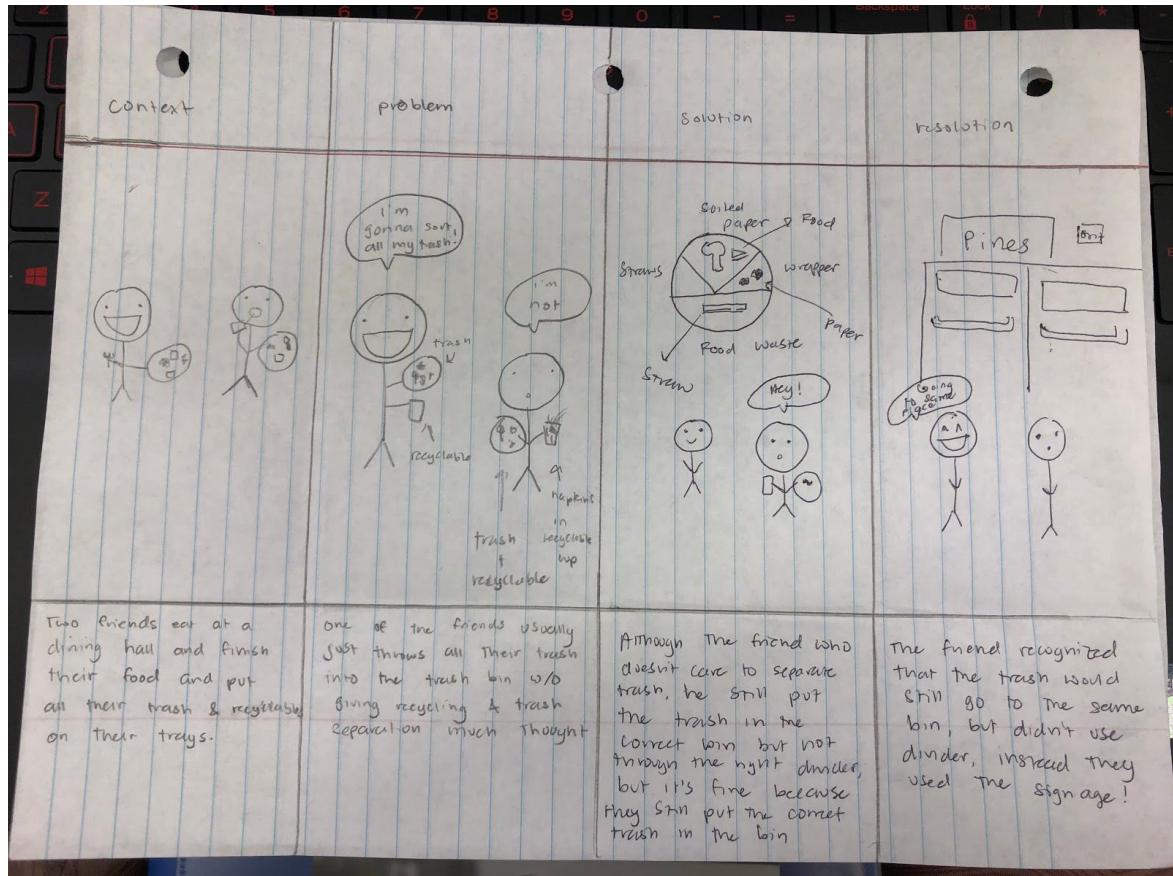
Storyboards

Team Stakeholders Version 1.0 5/21/18			
Context	Problem	Solution	Resolution
<p>Two students, Bill and Ted, enjoy a meal in Pines with plastic plates and utensils, with some plastic drink cups and an Odwalla.</p>	<p>Bill and Ted accumulate a heap of trash, but much of it is recyclable! They're often confused about this.</p>	<p>They notice a new design on the trash cans! It seems to them that most of what they have can be recycled.</p>	<p>Bill and Ted are able to properly sort their trash and toss the rest in the recycle bin, where they can go on to be processed and reused.</p>

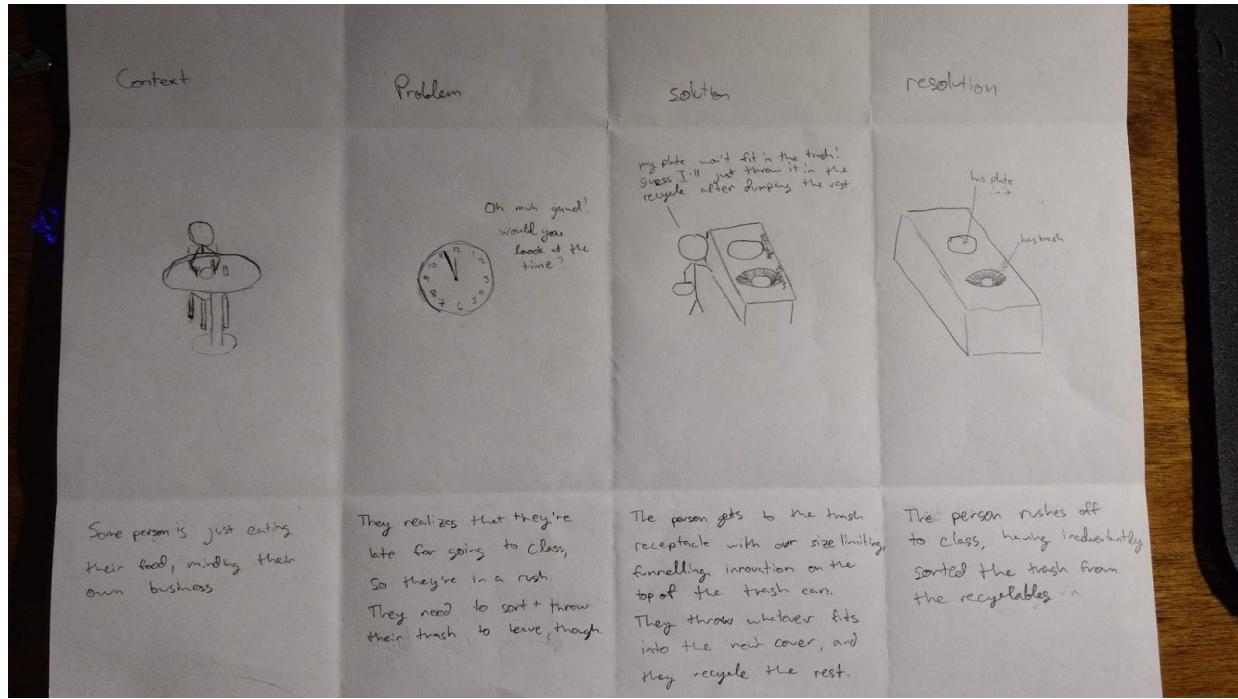
This storyboard represents two dining hall consumers at Pines who are just finishing up eating. As they begin to approach the exit, they must sort their trash from their recyclables. Though they are conscientious that they should be doing this, they generally have trouble knowing how to do so. They reach the trash receptacles and notice our prototype design for the new trash cans. With the aid of the easily visible and distinguishing dividers, they are able to easily sort out their trash first, then put everything that's left into the recycle bin. This allows for the consumers to recycle items they wouldn't normally see as recyclable and throw away the things they thought were recyclable but actually aren't. This appeals to students like this who want to recycle better, but generally don't know where particular items go.



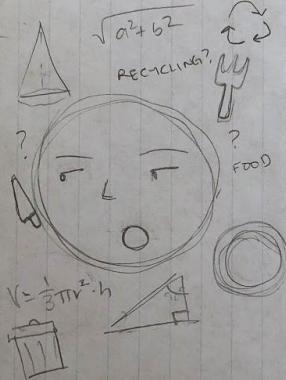
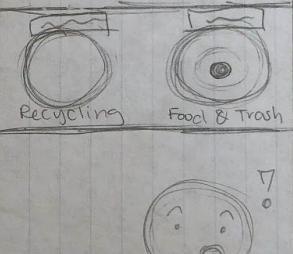
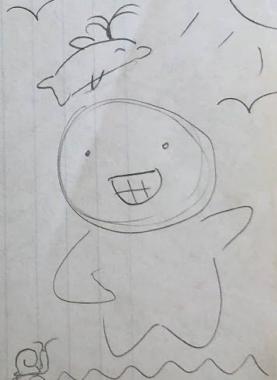
This storyboard exemplifies how dining hall workers are impacted by the proper sorting of waste by our primary stakeholders (students). Should they do it improperly, the recycling bag just gets dumped into the trash. If we can design a system that facilitates our stakeholders' proper separation of waste, then the recyclables will be worth recycling by the workers.



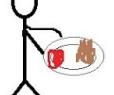
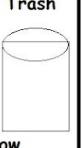
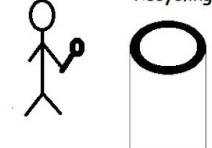
In this storyboard, two friends are eating at a dining hall, but one of the friend's never takes the time to separate their trash. Here, the friend walks to the trash can and sees the new prototype design, acknowledges that food waste and certain trash go into the bin but doesn't use the dividers. The prototype was still successful in bringing awareness to the friend and made them more knowledgeable of which trash goes where.



In this storyboard, there's a person who chose to dine at the dining hall enjoying their food. They realize they're late for class, so they have to quickly get rid of their trash. They make it to the receptacle and they throw everything that fits into the smaller, funneled trash bin, then recycle the rest because the rest fits in the recycling bin. The trash bin doesn't inform the people what necessarily is recyclable, but it certainly prevents them from easily throwing away recyclables.

CONTEXT	PROBLEM	SOLUTION	RESOLUTION
	 <p>Jim has just finished his meal at Pines and is ready to throw away his trash, which includes a mix of recyclable & nonrecyclable materials.</p>	 <p>Jim is trying to be better at recycling because he knows trash is bad for the environment, but he has no idea what goes in which bin.</p> <p>He notices that certain trash items only fit in specific holes and follows the easy-to-follow signage!</p>	 <p>Having separated his trash correctly, Jim feels more confident in his knowledge of recycling.</p>

This storyboard depicts the use of one of our early prototypes that used different sized trash and recycling holes after our observation that most of the recyclable items were rather large and most of the items belonging in the trash could potentially fit in smaller holes. In the storyboard, Jim utilizes the system correctly to his knowledge, which boosts his confidence in trash and recycling sorting knowledge. While this solution was potentially usable in very niche situations and settings, we ultimately decided to move in other directions as it posed many confounds.

Context	Problem	Solution	Solution	Resolution
 <p>Person A is eating food in the dining hall. He has a mix of trash types</p>	 <p>He is going to throw away his trash, but has never felt motivated to understand how or try to sort his trash</p>	 <p>Introduce a pause in his actions with a divider in the trash bin. Sorting instructions are next to the trash hole.</p>	 <p>After sorting the trash he assumes the rest is recycling</p>	 <p>Yay, that was easy enough.</p>

By: Kent Tsang

The story is based on the use of our latest prototype. The user is a person who for the most part does not separate their trash either due to lack of knowledge or motivation. He is physically impeded from casually tossing all his trash because there is a divider in the middle of the trash can. This pause in motion will hopefully make him take a look at his immediate surroundings such as the sorting instructions on the sides of the hole. Next we assume he will toss the rest of the items not listed on the trash into recycling.

Prototypes

Early Prototypes:



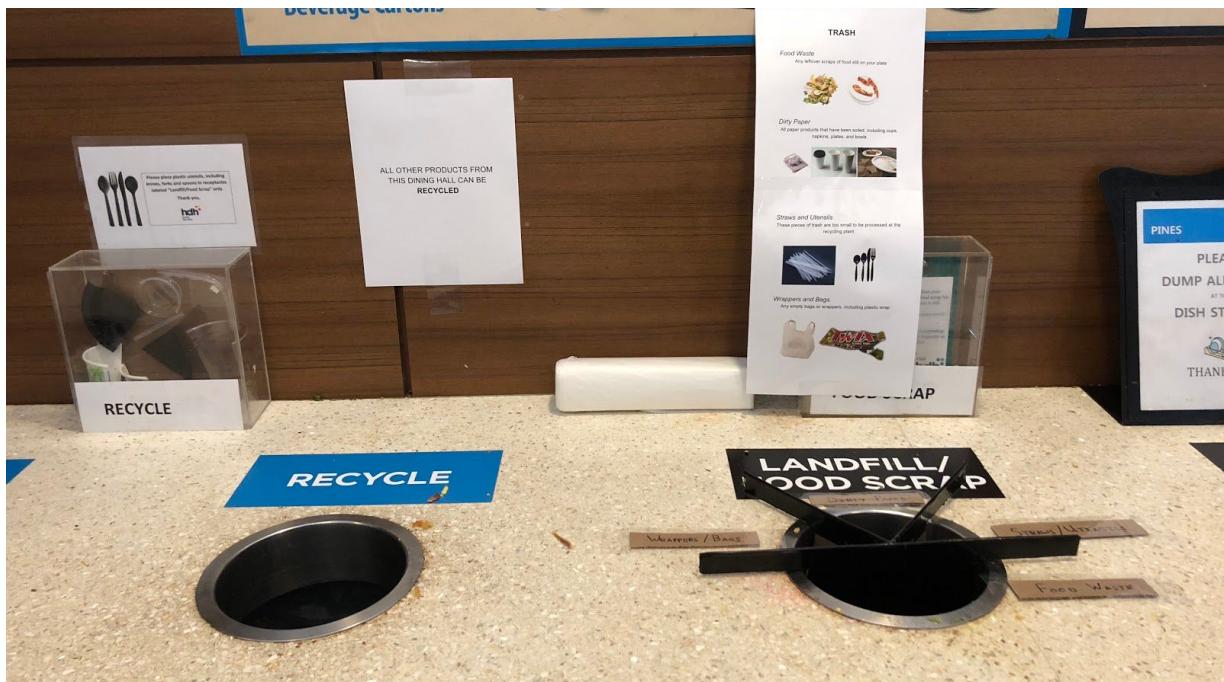
Prototype 1:



Recycling hole with signage

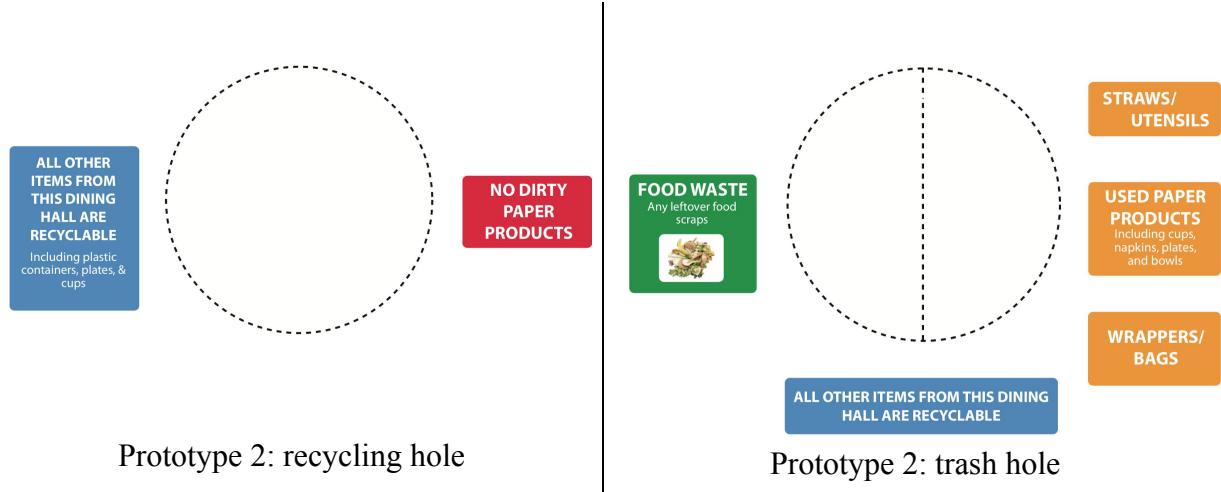


Trash hole with dividers, labels, and signage



Prototype 1

Prototype 2:



Live Prototype 2

User Tests

Prototype 1 Tests:



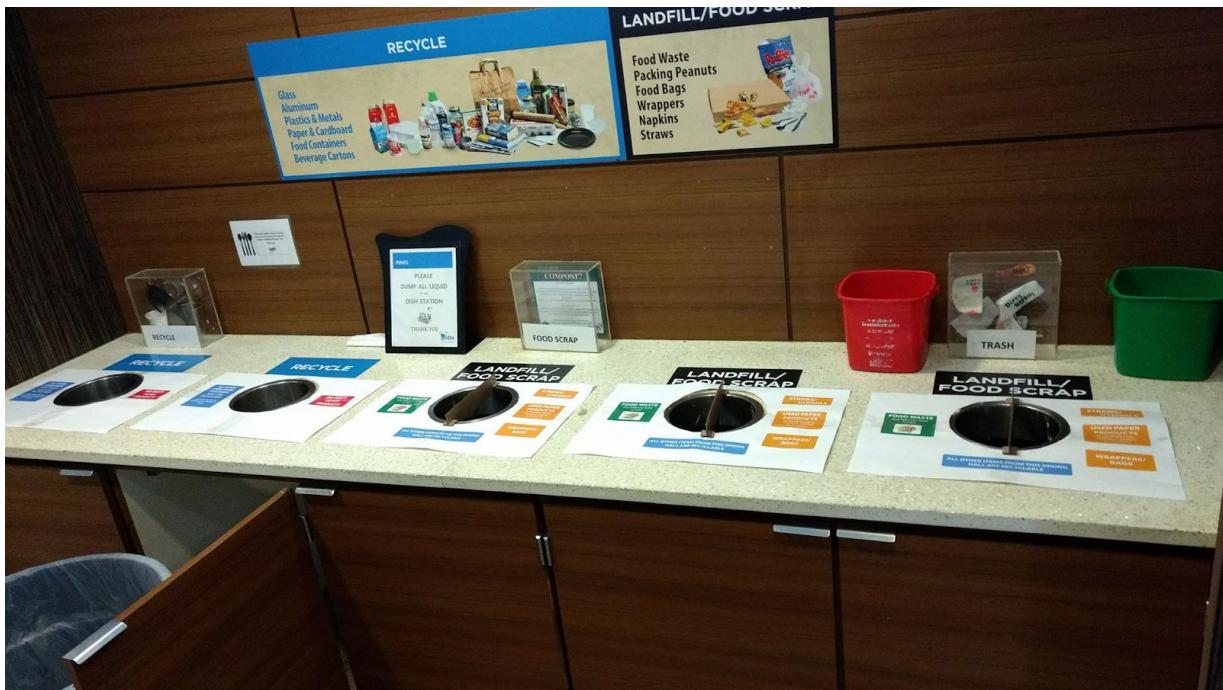
Prototype Trash Bin after 2 hours:



Control trash bin without prototype:



Prototype 2 Tests:



Prototype Trash Bin after 1 hour:



Control trash bin without prototype:



Recycling Bin after 1 hour



Prototype 2 Trash Bin



Prototype 2 Recycle Bin



Prototype Trash After 1 hour



Prototype Recycling After 1 Hour



