The Convenient Composter

Students:
Adrial Chua
Beatrice Ngoei

School: Holy Innocents' High School

Theme: Environmental Wellness

Teacher Mentors:
Mr Siew Meng Ren
Mr Alvin Liau

Part 1:
Understanding The Challenge

Exploring Data
Framing the Problem

Why does food waste exist?

1. People only buy food that looks good, causing uglier, unbought foods to be disposed and wasted
2. No clear reason for people to recycle food
3. Oversupply of food
4. Buying more than you can eat
5. Food spoilage due to improper handling or storage of food
6. Improper disposal of food waste
7. Nobody wants to spend time to recycle food

Problems with Food Waste

Wasting food also wastes the resources used to produce it
When we waste food, we also waste all the energy and water it takes to produce, transport, and package it.

Wasted food decomposes and has repercussions
And if food goes to the landfill and rots, it produces methane that is a greenhouse gas even more harmful to the environment than carbon dioxide.
Uneaten food also attract pests like ants and rodents

Food waste situation in SG

- In 2019, SG produced 744 million kg of food waste
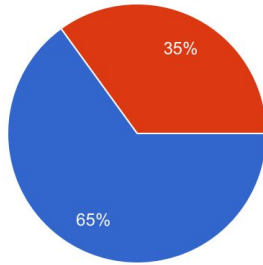- Only 19% of food is recycled in SG

We made a survey and these are the results from the 40 participants:

- 65% of them strongly agree that food waste is a big problem in SG
- 52% feel that environmentally friendly ways to dispose of food waste is inconvenient or inaccessible
- 55% of the participants feel that they waste half to a whole bowl of rice worth of food everyday while 22.5% feel that they don't at all
- 72.5% of the participants are willing to save food waste at the cost of some time, while 12.5% are unwilling.

Survey results:

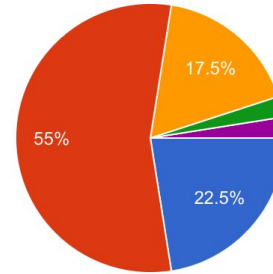**Do you agree that food wastage is a huge problem**

40 responses

- Strongly agree
- Agree
- Disagree
- Strongly disagree
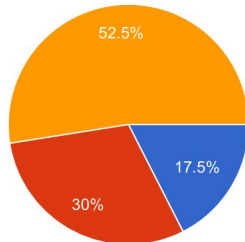
65%
35%

How much food do you think you waste everyday?

40 responses

- No food
- 0.5-1 bowl of rice worth
- 1-2 bowls of rice worth
- 3-4 bowls of rice worth
- 4< bowls worth

17.5%
55%
22.5%

Do you agree that environmentally friendly forms of disposal for food waste is convenient/ accessible?
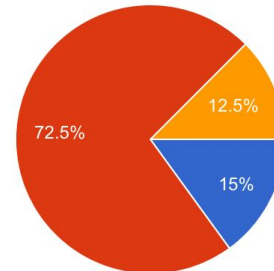
40 responses

- Strongly agree
- Agree
- Disagree
- Strongly disagree

52.5%
30%
17.5%

Would you be willing to save alot of your food waste at the cost of some time

40 responses

- Very willing
- Willing
- Unwilling
- Extremely unwilling

72.5%
12.5%
15%

Existing solutions (external):

https://www.straitstimes.com/singapore/food-waste-digesters-to-be-installed-in-10-schools-by-end-may

https://www.straitstimes.com/singapore/environment/pilot-to-turn-food-waste-into-w-fertiliser-to-be-expanded-across-tampines-by-2024

https://www.towardszerowaste.gov.sg/foodwaste/

https://www.science.edu.sg/stem-inc/news/learning-journey-to-eco-wiz-s-food-recycling-pilot-system

Why don't people recycle food more?

- They need a convenient system to dispose food waste
- They want to spend as little time as possible to recycle food but still not harm the environment
- They feel it is a hassle to recycle food
- They need a reason or incentives to motivate them to recycle food waste

Existing solutions:

Learning Journey to Eco-Wiz's Food Recycling Pilot System

<mark>Pros</mark>:
-Effectively educates on the global problem of food waste disposal
-Students are learning in methods that allow them to digest the information efficiently
-Constantly invested in listening due to lack of stultifying moments through teaching with games
<mark>Cons</mark>:
-Cannot teach large numbers of students, as seen from only 160 students going
-Education is unhelpful without the means to use it

Pilot that turns food waste into fertilizer at Our Tampines Hub

<mark>Pros</mark>:
-Helps reduce food waste
-Reduced number of truck trips for waste
-Can compost large amounts of food waste
-Fertilizer given to residents can be used for things like gardening
<mark>Cons</mark>:
-Many might find it inconvenient to bring food waste all the way there
-Many might find it inconvenient to sort the food waste
-Lack of motivation from the residents
-Very little use after residents lose interest

Ways to overcome the cons (previous slide)

Learning Journey to Eco-Wiz's Food Recycling Pilot System

-Host a mandatory school-to-school event/lesson to bring the system to each school and teach the students through hall assembly + games & information booth

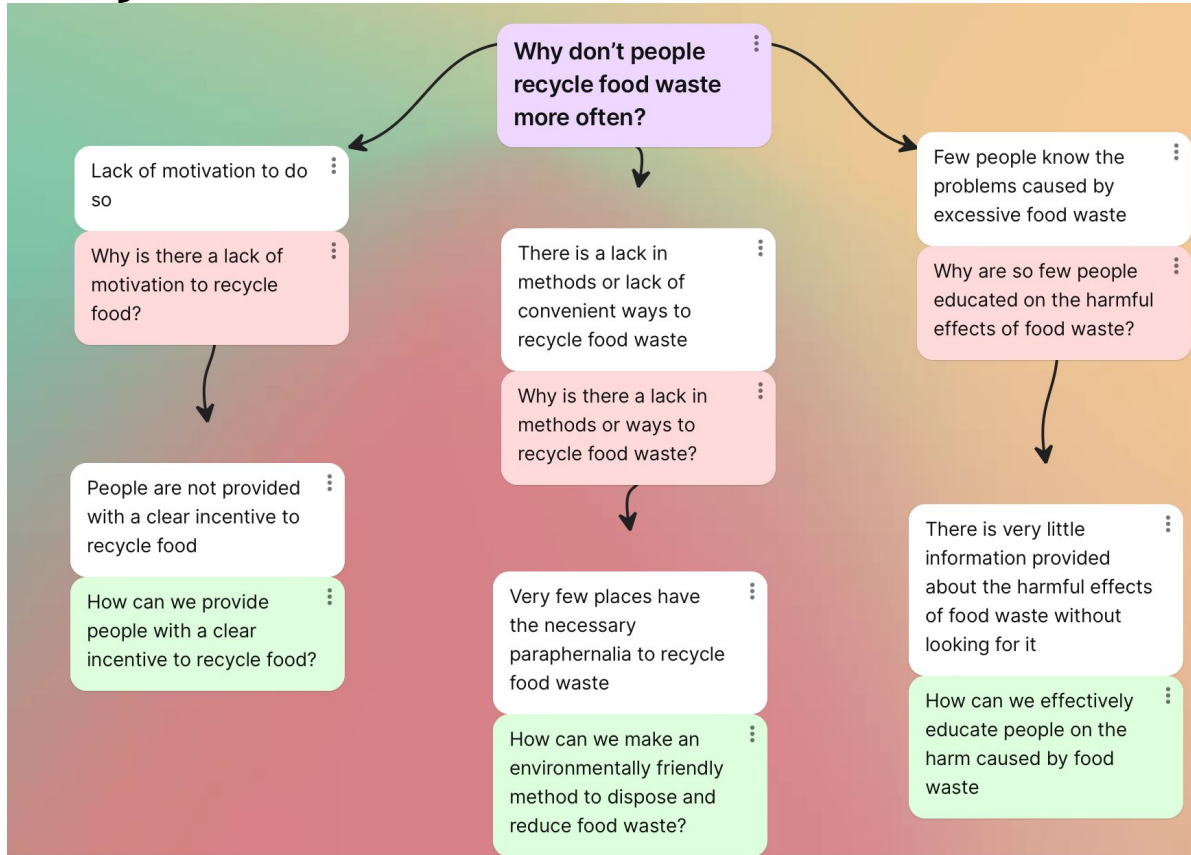**Pilot that turns food waste into fertilizer at Our Tampines Hub**

-Place more composters at common areas (eg. void deck)
-Include incentives (eg. voucher to redeem a free meal etc.)

Target audience and goal

Target audience: Secondary School Students

Goal: To help reduce the amount of food wastage by raising awareness and design a mutually beneficial system between food vendors and students. And getting students to participate in food recycling (composting)

I wonder why, I wonder how

Why don't people recycle food waste more often?

Lack of motivation to do so

Why is there a lack of motivation to recycle food?

People are not provided with a clear incentive to recycle food

How can we provide people with a clear incentive to recycle food?

There is a lack in methods or lack of convenient ways to recycle food waste

Why is there a lack in methods or ways to recycle food waste?

Very few places have the necessary paraphernalia to recycle food waste

How can we make an environmentally friendly method to dispose and reduce food waste?

Few people know the problems caused by excessive food waste

Why are so few people educated on the harmful effects of food waste?

There is very little information provided about the harmful effects of food waste without looking for it

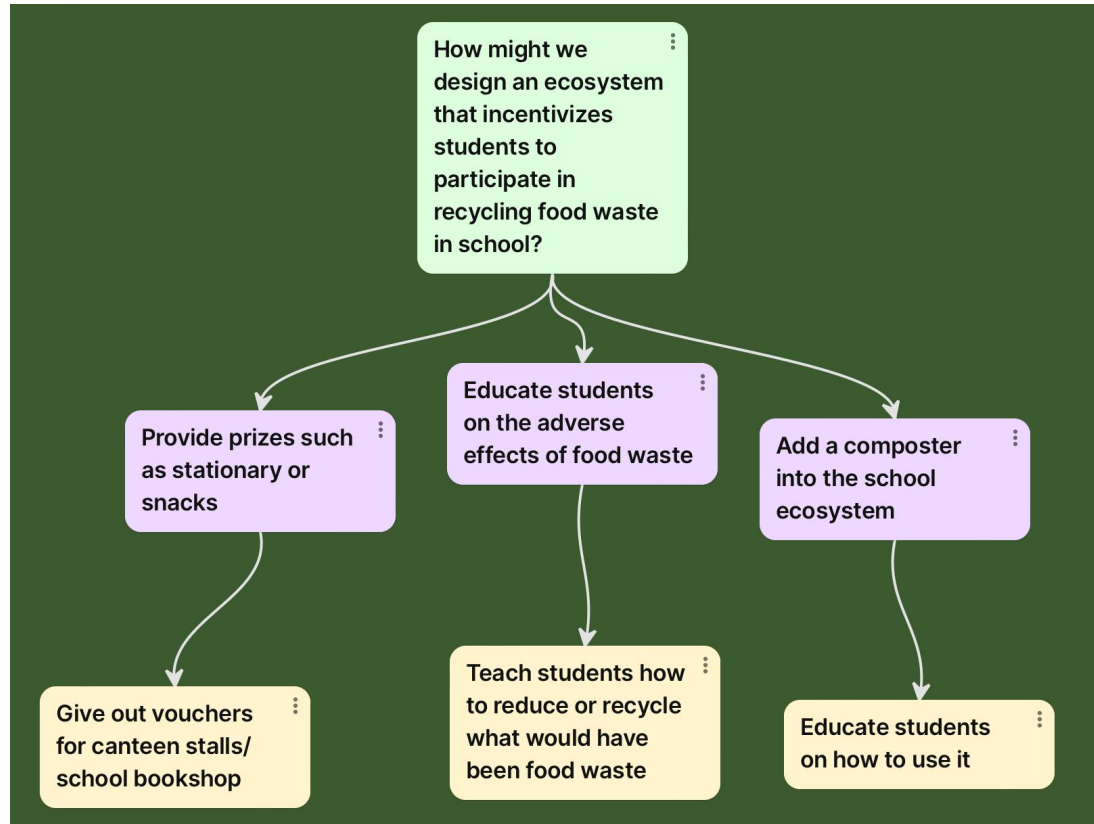How can we effectively educate people on the harm caused by food waste?

Problem Statement

How might we design an ecosystem that incentivizes **students** to participate in recycling food waste in **school**?
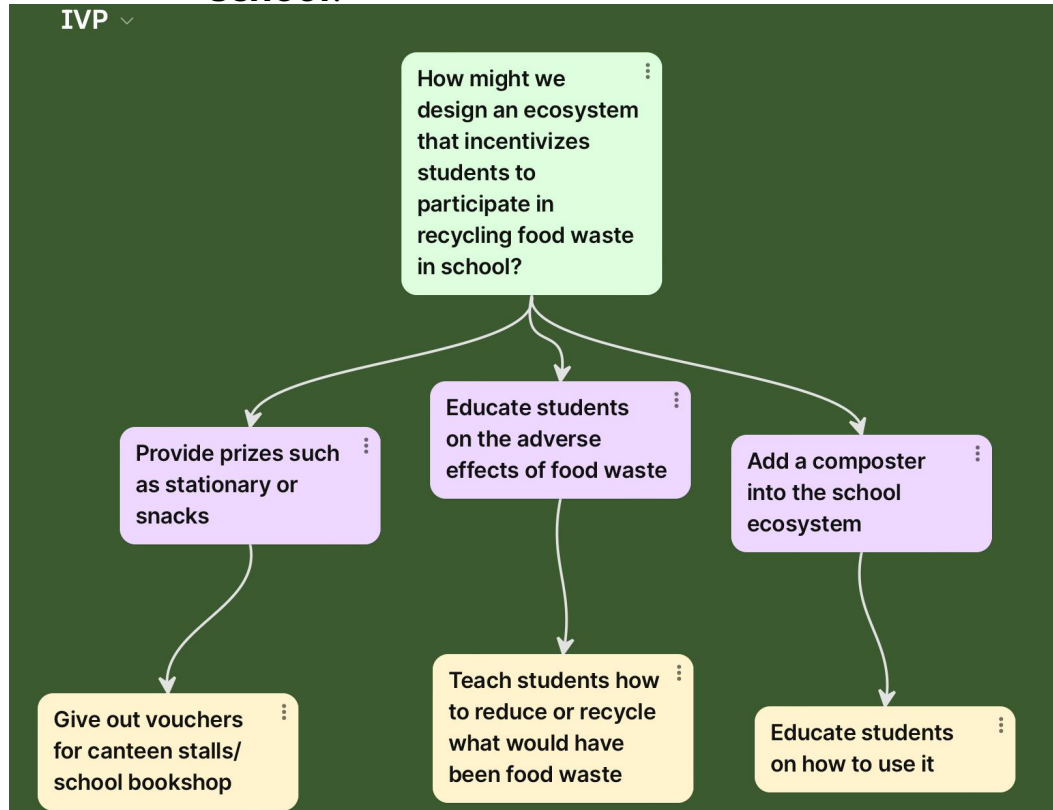
Brainwriting

Part 2:
Generating Ideas

Brainstorming Possibilities
Evaluating Ideas

Brainwriting

Evaluation of Ideas (next step)

Cost-effectiveness: How affordable is the idea?
Accessibility: How easily can the student access it?
Feasibility: How practical is the idea given the school's resources?
Convenience: How convenient is the idea to the student?
Efficiency: How efficient is the idea in achieving our goal?

Criteria (Weightage) / Ideas	Cost-effectiveness (3)	Accessibility (3)	Feasibility (3)	Convenience (3)	Efficiency? (3)	Total (15)
Adding a composting digester	1	2	2	2	3	10
Raising awareness	3	3	3	3	2	14
Adding incentives to get students to recycle food waste	2	2	3	2	3	12
Implementing multiple food composters	1	3	2	3	2	11

Part 3:
Developing Solutions

Prototyping & Testing
Refining the Prototype

Prototype: Raising a campaign - The Convenient Composter

Step 1: Make an announcement on the recycling campaign in school

Step 2: Paste posters of campaign all classrooms to reach out to the student body to catch their attention

Step 3: Hold the compost station in canteen for students to recycle their food & educate them