RePlastic

RePlastic is a service with the goal to engage students in Trondheim to collect and map waste from nature, explore the possibilities of how to reuse and recycle this waste in different ways, and use the data to push for policy changes.

A project for Experts in Teams - Ocean Plastic Waste, TEP4854 Spring 2021. Made by Ella Swan, Lama Mourad, Marius Eriksen, Mathilde Tillman Hegdal and Sondre Fyhn

Background

Problem Statement:

How can we engage students in Trondheim to collect and map plastic waste in nature, to gather data that can motivate local policy change, through an app?

Problem Description

Plastic waste in nature is harmful to ecosystems, wildlife and humans. It can take hundreds of years for plastic to break down, so the damage is long-lasting[1]. Still, humans produce and use large amounts of plastic and a lot of it ends up in nature.

It's important to collect the plastic waste that is already in nature, but also to decrease the amount of new plastic waste that enters nature.

By getting a picture of the littering in an area and monitoring it, data can be collected. This is useful, both to gather data about the littering, identify sources, and to implement and evaluate measures.

While there are some apps that aim to aid persons when collecting plastic waste, to support mapping and data collection and to use social aspects to make it more fun, the existing solutions mainly attract users who are already engaged in environmental issues and collecting litter in nature.

That's why this project aims to engage a larger amount of new, not previously engaged, users.

Personas

Three personas were made based on the key findings from user interviews. The personas are used to process and structure the findings, and make them more relatable.

Hanne

21 years old
Female
Architect student, 1st year

"(cleanups) feels like a spit in the sea. But if everyone spits in the sea, it has an effect and starts a change"

Hanne spends a lot of time studying. But in her spare time she enjoys climbing, skiing, hiking and generally being outdoors. She also spends a lot of time with friends and loves a good party. Through her interests, she can see the human impact on nature. This has made her very aware of the problems of climate change and plastic litter, and she worries about this and feels engaged.

Behaviour:
- Separate waste, ride a bike, eat mostly vegetarian food, avoid plastic products, read and research about sustainability
- Pick up plastic when I see it in nature, most times, since I know what can happen with it otherwise.
- Picking up trash makes me feel good, like I'm contributing to a good cause
- Have never participated in organized cleanups

Pain Points:
- Sometimes, the rubbish is nasty and I don't like to touch it
- The size of the waste and dirtiness as well as where I'm heading affects whether I pick up rubbish I see
- Feel sad when I see plastic waste in nature. It's wrong

Goals:
- To have a clean environment and leave a healthy planet to my future kids
- Good self-esteem

Frank

27 years old
Male, from The Netherlands
Economics exchange student

"I have never walked out the door with the intent to collect waste"

Frank has had problems with injuries and can't exercise too hard, run or walk too far. He enjoys going to the gym, taking walks and cross-country skiing in winter, but spends most of his time with other exchange students, exploring Norway.

Behaviour:
- Pick up waste sometimes when I see it in nature, but never in streets
- Have not participated in organized cleanups
- Have to confess, I engage too little in environmental issues
- Sustainability is important when voting
- My actions have an impact - but only if part of a movement. Like Greta!
- The problem is too global, long term and diffuse. It needs to get personal.

Pain Points:
- I don't like to see plastic in nature. But I don't like to pick it up either. It's all a negative experience
- It takes very much time, for very little effect. Not worthwhile

Goals:
- Being part of a movement, contributing to a good cause
- Would pick more waste if it was worthwhile, if it had a larger impact or if I got a benefit from it

Arin

24 years old
Male
Computer Science student, 4th year

"I feel like the global issue is so large that it has to be solved at a level above countries"

Arin is a student at NTNU. He enjoy playing soccer, spending time with his friends, playing video games and watching movies and tv series. He is also active in the linjeforening. Arin is not an outdoorsy person, and while he's aware of the issues of climate change and ocean plastic waste he does not engage in these questions.

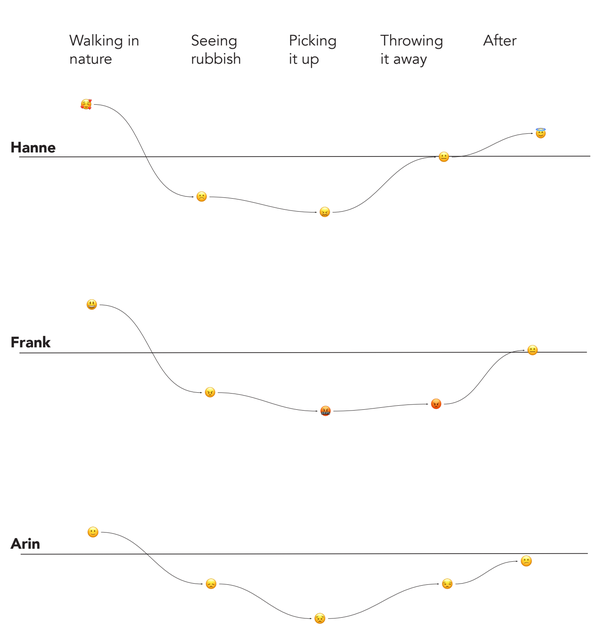
Behaviour:
- Have attended organized cleanups with schools and sports club
- Have not collected plastic waste on own initiative
- Separate some waste at home
- My actions do not have an impact

Pain Points:
- Not motivated to pick up plastic, since it seems like an ever-lasting problem
- Waste is nasty, it is not nice or fun to pick up

Goals:
- Have environmental issues solved by international governance and technological innovations

Emotional journeys

Feelings related to the experience of picking up rubbish in nature, currently - without the solution.



Solution

This is Frank.

One day at school, Frank sees some items made of plastic waste on display. The products catch his interest since they look nice and he is curious to know how they were made.

Frank scans the QR code attached to the objects, and is directed to a website describing the concept. He learns that the products are made in a plastic recycling workshop at NTNU of plastic waste collected by NTNU students.

Frank downloads the app to join the project. He gets to set a goal for what kind of product he would like to collect plastic to make, and decides on a frisbee.

The same day when Frank is about to walk home from school, he pushes the start-button to "record" his waste collection on his way home.

Every time he sees a bit of rubbish, he picks it up.

In the app, he presses the plus-sign to add waste, and selects the correct tag for the kind of plastic he found.

His route and data about the amount and kinds of plastic he found where is saved so he can see it in the app. He can also see where other users have been recently on a heatmap. There is also information and statistics showing the impact of their efforts.

Frank also uses the app when he is on a hiking trip by the ocean with his friends. He shares a photo of a pile of waste to stories, with the location tagged. He makes an estimation of the amount and kind of plastic and tags it.

Frank delivers his collected waste to the collection point at NTNU and helps sorting it. He can see on the app how close he is to collecting enough plastic to make a frisbee.

When he has reached his target, he buys his frisbee and pays with his earned points and the small amount that's left with the money.

Frank thinks it's cool to have a frisbee made of plastic he picked off the streets himself. He gets comments about it from his friends and enjoys telling them about how he got it, how it's made, and of what.

This is Hanne.

Hanne joins the new anti-plastic pollution club at NTNU. There, she gets to work in the workshop and make products which is fun, but they also receive the waste, sort it and use the statistics from mapping to push for policy change in different ways.

She feels like she's part of a movement and might contribute to something good, while she's also spending time with friends and participating in a club that will look great on her resume. Her favorite part is making up new projects and ways to use waste that can't be recycled. Currently, cigarette butts are being used for an art project.

This is Arin.

Arin learns about the anti plastic pollution app and club when his student organization gets involved in a challenge where the members together will try to collect more waste than the other student organisations. He likes how something boring was turned into a fun competition, and he gets motivated by feeling like a part of a bigger movement, and by the information about the impacts of their collective action.

Concept Description

The concept is a service consisting of two parts - an app and a plastic recycling workspace run by a student organization. The goal is to engage students in Trondheim to collect and map waste from nature, explore the possibilities of how to reuse and recycle this waste in different ways, and use the data to push for policy changes.

The app is mainly used to engage students to collect and map litter, by setting a goal, keeping track of progress, and occasional challenges. The app has a function to record clean-up routes and shows where users have recently cleaned up in a heatmap. When picking up waste, it's easy to tag the waste to a location and a category for mapping. It's possible to share and see stories from other users, and there are statistics and information showing the impacts of the mutual effort.

In the app, the user chooses a target product and gets an increase in weight for the plastic collected that can be recycled, and in points for other kinds of waste. When enough plastic to make the target product is collected and delivered to the workshop, the user gets the option to change the goal, or to buy the product for a low cost, paying with points or money.

The student organization runs the recycling workspace, where the collected litter is delivered, sorted, cleaned, shredded and molded into new products. The litter collected that can't be recycled is sent to other recycling facilities or reused in other ways. The students working in this organization also monitor, analyze and use the data collected to push for policy change as well as making up creative ways to reuse litter and use recycled plastic.

The workspace is a place for exploring innovative reuse and recycling of waste and could be sponsored by companies or by NTNU. The workspace has the opportunity to recycle kinds of plastic that are normally not recycled, since they should not be profit-driven and can have more freedom to experiment.

The main goal of the concept is to engage students. The idea is to use the curiosity, tradition of volunteer work and environmental engagement of NTNU students to explore the possibilities of plastic recycling and litter repurposing and to reduce the amount of plastic in nature through collection and policy change. The concept will also spread awareness and knowledge amongst students and help them see the value of plastic waste. The motivation of users to pick up waste will be improved by the possibility of making a product from it, by feeling like a part of a bigger movement, by seeing progress and by contributing to policy change.

To encourage users to collect all kinds of waste, the point system will be dynamic. For example, picking up cigarette buts could provide many points, as well as to collect facemasks during a pandemic. There could also be campaigns during which certain items are worth more. There should also be functions to join teams and have competitions, for example between different classes or study programs.

In the beginning, there might only be a small collection of easily made products to choose from as a target product, for example a bowl, a frisbee and a carabiner. This could then grow to include more different products, for example t-shirts, phone cases or stools.

The concept aims to attract and engage a larger amount of people in a shorter amount of time, rather than the opposite. This works well as a concept at NTNU, for students, since there is a flow of new students, and potential users, arriving every year. And even though the app is only used for an average of some months per user, the new awareness might have a longer lasting impact.

Challenges and future

Before future implementation, there are some challenges that need to be investigated to validate the concept.

- The plastic in nature is usually damaged, contaminated and maybe not useful. Will it be possible to make products from this kind of waste?
- How much plastic will be needed to make a product? Is it a reasonable amount? Or will the plastic feel even more worthless because of how much is needed?
- How to deal with the plastic waste that cannot be recycled at the workshop?
- Who can fund the machines for the workshop?

For further implementation, the next step would be to investigate the challenges and to get input and feedback on the concept from users. Then, it would be suitable to contact NTNU to get their opinion and approval and start the collaboration. The next task would be to calculate the initial cost of the workshop and the app, and apply for funding and sponsors.

Meanwhile, the concept should be detailed and the app should be designed, through several iterations of prototypes and user tests. When the app is designed and the funding is secured, it is time to develop the app, build the workshop and create the student organization.

1. Parker, L (2019, June 7) The World's Plastic Pollution Crisis Explained. *National Geographic*. Retrieved from: https://www.nationalgeographic.com/environment/article/plastic-pollution