Improving the waste separation on campus

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Thesis summary

In this document, I will go through all the steps that were taken during this project, the problems I encountered and the thought process behind their solutions.

To start this summary, I will in short introduce the goal of the thesis, which is to increase the accuracy of waste separation for the outside waste bins on campus.

Improved recycling and reuse contribute to a circular economy and help reduce the CO_2 emissions of waste. This reduction of the CO_2 footprint should be done by providing design solutions that facilitate accurate waste disposal behavior and recycling. This assignment was created to help achieve this target.

The first step that I took was to investigate the current state in which people separate waste when they use the outside waste bins. This was done by using multiple forms of analysis: observation, interviews, and comparing the waste of the outside waste bins with that of the inside waste bins. All of this analysis alongside some literature research resulted in the list of requirements for the project. A waste analysis was also done on the contents of the outside waste bins in order to compare the results with those of a later analysis that would be done after a prototype of the intervention was implemented.

The outside bins are located at multiple locations on campus, and each location has three waste bins: one for residual waste, one for plastic and drink carton waste, and one for paper waste.

This waste analysis consisted of me going through the waste of each waste bin and weighing the amount of incorrect waste that is present in each waste flow. As an example, for the residual waste bin, I measured the total weight of the bag, then removed all the plastic and drink cartons and weighted that on its own, then removed all the paper and weighted that on its own as well. All these measurements were then put into an Excel sheet to calculate the respective percentage of each type of waste in every waste flow.

The most important point I took from the analysis phase was that the people were mostly separating their waste incorrectly due to a lack of knowledge/understanding of what type of waste belongs in each waste flow. Thus, multiple concepts were made to remedy this lack of knowledge. These concepts were evaluated by the terrain manager of the University of Twente (Andre de Brouwer) to see which could be made into a functional prototype. Out of the three concepts provided, the idea of placing an informational banner behind the waste bins proved to have the most potential.

From there on I started to improve upon this concept and work out the content that would be displayed on the banner. Inspiration was taken from a project done previously by Green Hub about what kind of information displayed behind the inside bins had the best impact on people's separation habits. They found that it is better to use imagery instead of text; thus, the banner I designed makes use of imagery that displays what type of waste belongs to each waste flow. This was all done by adhering to the already existing colour coding from the Dutch government, this means that the paper waste flow is indicated by the colour bleu, the residual waste by grey, and the Plastic and drink carton waste by orange.

In order to get a functional prototype, I got into contact with a company that has made banners for the university before, Sedo Signing. From them, I ordered a large banner with my design so that I could place it behind the waste bins and see if it would have a positive impact on the waste disposal behavior of the people.

4 days after installing the banner, new bags of waste were collected and analyzed the same way as the first waste analysis, to see what the impact of the banner would be.
This resulted in an increase in correct separation by 4%. The result is technically a positive impact, but it can be argued that the improvement is too small to justify the placement of a banner at all the outdoor bins. As the cost of the intervention may outweigh the benefit it provides. Therefore, further research is needed to prove the feasibility of my intervention.