

Public Summary

Bachelor Assignment Olga Lackner | Industrial Design Engineering

The aim of this bachelor assignment, provided by the Campus and Facility Management of the University of Twente was to find a solution to decrease waste on campus in order to work towards the UT's sustainability goals. As the focus of the assignment, recurring events on campus were chosen, specifically the bi-yearly Kick-In that introduces new students to the university. The main research question to be answered was "How can the Kick-In of the University of Twente be made more sustainable to align with the UT's sustainability goals?"

Based on interviews and the research conducted about the event background, waste left behind by attendees turned out to be the main problem needing to be solved. Research showed that event participants often feel a lack of responsibility as they will leave the event site and expect staff to clean up anyway – in this case volunteers. This led to the goal of "increasing the level of waste collection during the Kick-In through improving attendees' awareness of bin locations and motivation to correctly dispose of trash." Since the solution aims to improve the event while promoting a positive change in people's behaviour, it should be fun and integrate seamlessly with the event as well as not feel like a chore that has been forced upon attendees. The research conducted on event industry trends in sustainability led to the conclusion that gamification is the most viable approach to changing people's behaviour. Gamification has been successful in changing people's behaviour subtly by introducing game-like mechanics to the completion of a task as encouragement.

The design phase led to a motion detector that is able to recognize whenever an item is thrown into the trash cans and provides immediate feedback to the user. The disposed of item is also added to a total score of trash correctly disposed of during the event to provide incentive to attendees and give them a feeling of satisfaction about not leaving waste on the ground. This tracking device can be attached to the waste bins on campus and connects to an external screen to display a visual of a cleaner campus as further encouragement to users for changing their behaviour.

After testing the main functions of object detection and counting, the product was checked on fulfilling the initial list of requirements. It met all points except for weatherproofing and a wish to reuse existing waste. As the intent of the assignment is to improve on-campus sustainability, the design was also evaluated on each main components impact on cost, function and end of life of the product. Most of the components are reusable or recyclable, however the battery choice should be reconsidered in the next iteration. A limitation of the assignment's duration was that the design could not be tested during the event, therefore no conclusion can be reached on whether the product would be successful in implementation. To this end a risk assessment was also done, which identified a lack of interest on the user's side and product failure or interference as the main risks for failure.

Waste is an ever-growing problem in every part of life, though often invisible to the average consumer. This is also the case for the University of Twente's bi-yearly Kick-In event for new, incoming students. In an attempt to decrease the waste left strewn across campus following the event, this bachelor thesis introduces a gamification approach to encouraging students to throw their waste into the provided waste bins instead of on the ground, leaving it to volunteers to clean up.

The research conducted over the course of three months looks into the event details and event industry trends in sustainability, leading to the conclusion that gamification is the most viable approach to changing people's behaviour. This leads to the design of a tracking device that, when attached to a waste bin, detects items thrown into the trash and adds them to an overall event score along with displaying a visual of a cleaner campus to encourage users and give positive feedback on their behaviour.