Decrease Environmental Impact by Changing Dietary Habits

"Understanding the role of dietary habits in food packaging waste generation and implementing design to stimulate less environmental impactful habits"

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This thesis researches how an individual's ecological footprint can be reduced based on dietary habits. Over the past years, the climate crisis has become a more pressing and concerning issue. It is not only the governments and companies responsibility to act on this, but also of the population. It is essential for individuals to adopt an eco-friendlier lifestyle in order to reduce their impact on the environment.

In this thesis, the following research question has been formulated: "*What is the best and most effective approach to reduce the environmental impact of dietary habits of consumers?*". With the use of an analysis and a design phase, this question will be answered. The analysis phase focuses on the difference in waste generation between different diets under young adults. With the use of a quantitative survey, it is first researched what dietary habits are presented in young adults, ranging from 18 to 30 years old. Based on the outcomes, a qualitative survey is conducted. A selected number of participants following a certain diet are asked to monitor their dietary habits for three days. From this, the environmental impact of the different diets and meals is researched. The design phase consists of the design challenge to create a solution to inform and guide consumers on how to reduce their environmental impact based on their dietary habits. With the use of literature research, essential aspects for such a design are identified and after ideation and concept development, an application is created.

The results from the analysis phase reveal that the most popular diet among young adults is the average Dutch diet. This is followed by a flexitarian and vegetarian diet. Vegan and Mediterranean diets have a low number of followers. Other diets such as pescetarian, whole foods and ketogenic are minimally followed.

Based on these outcomes, a total of four focus groups have been composed for the second survey. These are an average Dutch, flexitarian, vegetarian, and plant-based group, existing of vegan and Mediterranean followers. With a qualitative survey, it is discovered that the vegetarian diet has the lowest impact ratio overall. The flexitarian diet scored the highest overall impact ratio. There is a big distinction per meal on how high the impact ratio is. The dinner meal has the highest influence, followed by lunch. Additionally, research about the different types of packaging material each diet utilises is done. It is concluded that plastic packaging material is the most used material over all the diet, mostly by vegetarians.

The second part of this thesis focuses on the design challenge of creating a design that guides and motivates its users into following a more sustainable diet. This is realised with the design of an application that helps users select products with a lower environmental impact and supplies them with information and tips to reduce their ecological footprint. This application can be used to track dietary habits and the impact of consumed products, to find less impactful alternatives by searching or scanning a product and to learn new recipes. The application has been evaluated by a selected group

of testers on the understandability, functionality, motivational aspect and appearance. Overall, it scored a four out of five.

The results from the two phases combined lead to the best and most efficient approach to guide consumers into more sustainable dietary habits. By combining the outcomes from the analysis phase, which showed that animal-based products contribute greatly to the impact ratio and that plastic packaging is still used most in all diets, and the design phase, an integrated solution is created. The designed application educates its users about the impact of their dietary choices, offers them more sustainable alternatives, and helps progress their ecological footprint. Consumers are motivated to adopt a more sustainable lifestyle. The combination of educating consumers and making the information easily accessible makes taking the step towards living a more sustainable life achievable.

A number of limitations were present in the current study. First of all, the outcomes of the analysis phase have been restricted by time constraints. Next to this, in regard to the calculations done in the analysis phase, the values have been based on averages, which could have distorted the values slightly. Another limitation is that the evaluation used for the design phase has only been conducted by a small participant group. Additionally, the evaluation was completed online by each participant without supervisor and only with partial functionality of the application. For a more accurate evaluation, this should be adjusted.

The research conducted in this paper can be used as a base for further research about dietary habits and their distinct impacts. The application that has been designed, once it has undergone the necessary adjustments, can be a useful tool to implement into the daily lives of people that desire to decrease their environmental impact.