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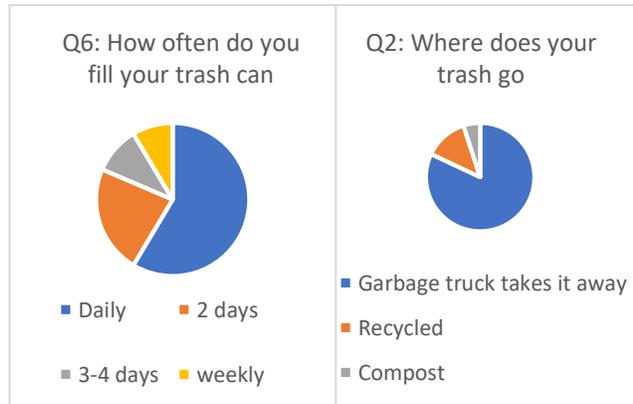


Project Aim: The project name, “Green Angels” exemplifies our focus on social and environmental sustainability. As part of IAA culture, the cleaning staff are nicknamed, “Blue angels” due to their uniforms, we want to extend the courtesy by working on our home country of Jordan’s Sustainability and Cleanliness since it is one of the dirtiest in the world. Our project started with three goals, overall attempting to tackle the issue of an unclean environment caused by an ill informed and ignorant local community. We specified to work with the younger generation’s habits and designed our project accordingly:

1. The first goal was to educate local schools and universities through a designed one-week curriculum consisting of daily brief sessions that focus on the daily habits of local citizens that most harm the environment.
2. The second goal was to establish a logistics system that connected local recyclers with homes better since with our survey, we noticed that although there are 2 recycling businesses in Amman, they don’t get much business since they are not getting business since many feel it takes too much time to get there.
3. The third goal was to improve the quality of production standards locally pertaining to a focus on environmental sustainability. We will design a furniture product that makes use of parametric design in order to ensure that organic design and flat pack design can work together – since the environmentally friendly flat pack design (that IKEA uses) is mostly boxy and doesn’t appeal to the younger generation. It will also incorporate circular economy and material science in order to be as environmentally friendly as possible - thus acting as an exemplar to inspire young aspiring designers in the direction of social and economically sustainable design.

Process: The best way we felt to organize our project was to rely on the design cycle, since all of us have design backgrounds at school (taking either art or Design technology as a subject), we were familiar with it. The design cycle goes through investigation, planning, taking action and reflection; ensuring that the final product is designed based off of research so that it is most efficient, as well as properly planned. The final reflection stage will also help us reflect on the success of the project based on originally planned design brief for the project as well as on what we learned in terms of strengths and how this project could be improved.

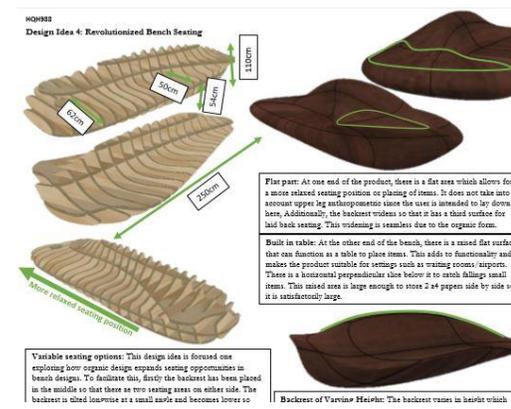
To start investigation, we conducted a preliminary survey that was focused on our local neighborhood and students our age at IAA– it was sent out through email as well as fliers posted with a QR code. The questions were created to find out the habits so we understand the type of waste and where and when it is thrown – asking questions like “how often do you throw out your waste?”, “do you throw trash out of car windows?”- this helped to create a tailored curriculum and schedule the recycling errand. After gathering 88 respondents, we analyzed the results , some key findings can be seen to the right. The second primary resource was in interview with Arianit Shehu, who is a local director at an NGO and thus provided valuable insight into the logistics side of things – particularly since he worked in the region we could discuss local cultural considerations (such as Fridays being religious days where no one works or special handling of trash) as well as streamlining the system. For the third goal, Jon worked independently to work on design based research; surveys, expert appraisal as well as internet research into anthropometrics, circular economy, flat pack joints, parametric design conventions, CNC machine use as well as materials such as



compostable bioplastics – all of this information to be used in the creation of the sustainable furniture. He also conducted an analysis of case studies which investigated strengths weaknesses, opportunities and threats of similar furniture. In the end he developed a design brief for this furniture.

To start planning, we specified tasks – Jon would work on the design component with help from Perla, whilst Eman and Haya would work on contacting sponsors as well as local educators to work on the first goal. Meanwhile Celina worked with Perla on creating the curriculum based on the survey and additional research as well as establishing the recycling errands system.

The design aspect of the project started work immediately to create a range of parametric design furniture design ideas that were compared against the research-based design brief. This process involved real life scaled down prototypes



(for testing), user-involved focus groups as well as a design expert appraisal (the school technician) to gather data on the success of each product as an environmentally friendly furniture product. Screenshots from the design portfolio can be seen above where you can see the aesthetic of parametric and organic design.

In terms of work on the curriculum, Celina and Perla made substantial work on additional specific research to help them create an awareness campaign that is suitable for a younger audience and fits within school scheduling. Celina and Perla used internet research as well as interviewed teachers at IAA for research as well as feedback on their curriculum and teaching style to ensure participation, interactivity and interest given the age group 13-20 (high school and early university students).

For the second goal of establishing the recycling errand, Celina and perla also wrote a sign up form using communication skills which was sent around amman communities of Dabouq, Abdoun, Sweilieh and Khalda – where we anticipate mostly people interested in participating in our project. This form included facts about sustainability, mentioned that the service was free and was written in a casual tone in both English and Arabic – to make the form sustainable it only occupies half a page to reduce paper usage. This form can be seen stuck up to a wall to the right.



As for the final taking action phase, the design section of the project was far ahead and completed this quickly. The material and CNC machine-based production was outsourced to local manufacturers. The furniture project went through some changes to remain cost effective (size, form and thickness changes) and Jon was taught by the specialists at the shop (called TechWorks) about slotting mechanisms used in the product and how to strengthen them. Utilizing local resources ensured social sustainability by investing money into the local market, encouraging growth as well as the environmentally friendly product diverting waste from poorer communities. The final product was donated to the design department at a leading design school to encourage similar products.



As for the first goal, the curriculum was proposed to 4 local schools and 2 universities, all of which rejected the offer since at this time of the year, classes are being used for finals preparation. In order to still accomplish the goal of educating our local community to a certain extent, we designed and stuck up posters in our local school community that told people to recycle, not throw waste as well as promoted the recycling errand by putting up sign up forms.



For the second goal, after getting 16 signups (which we delivered stickers with our logo to attach to their trash can), we ran errands on our local community using personal cars every week for 5 weeks as seen to the right. After these 5 weeks the system grew to 24 signups and we began designating volunteers from each community to carry out the duties – this was supervised through a whatsapp group to ensure that it is sustainably carried out.



Outcomes and Impacts:

In terms of accomplishing sustainability, the project did extremely well. For the third goal, extensive research had gone into ensuring the materials, chosen design aspects (parametric design, flat pack design, circular economy and CNC machine usage) as well as implementation of them, all lead to a sustainable product. The product is evidently environmentally sustainable since it is compostable and recyclable, and the flat pack function makes it more efficient to ship and store (less carbon footprint per product) making it more sustainable. It is also socially sustainable since the CNC production was outsourced to a local company, thus encouraging skills job growth on a local scale. This project being donated to the design department at IAA, will ensure that many future students are motivated to pursue similar or more innovative design aspects that lead to social, economic and environmental sustainability.

The first goal was not that successful since universities did not sign up for the programme. However, we tried our best to ensure that this goal of education was met as much as possible by designing and putting up posters in our local school community that serve the same purpose – of educating students about the dangers of their trash habits and providing alternate solutions (including the recycling errand so that the project links to itself).

The second goal was also very successful since we had a total of 24 signups (houses) which is a family each. Thus we are providing for roughly 100 people in a self sufficient system based solely of volunteers (cost efficient). Assuming 2-3 garbage bags per signup weekly, we saved 72 trash bags weekly, 360 over the 5 weeks we manually operated the system and since it is self sufficient with the help of volunteers, potentially much more over the course of this system running.

This success can be attributed to excellent communication through the medium of the sign up forms as well as an easy to use system of emailing and then having stickers sent to mark their trash cans.

Reflection:

Overall investigation has given us a lot of awareness of our local community and knowledge of logistics, design and ensuring sustainability – making GSL an enjoyable and rewarding experience thus far.

