

Designing a study lamp for Syrian refugees who live in refugee camps in Jordan

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Due to the war in Syria, a large number of refugees are fleeing to Jordan, which increases the burden in the energy sector. They are facing the problem that not enough energy is being provided to the refugee camps (AlKharouf et al., 2022). Therefore, solar farms are built to solve the problem of lacking energy. However, even though solar farms have been established, the energy is still not able to meet the needs for 24 hours and the refugees still experience frequent energy outages (Polish Aid, 2023). Lighting is considered the main energy consumption sector in the camps compared with others (UNHCR, 2018), so lighting is decided to be the focus of this project.

Compared with other purposes of lighting use, lighting for study can bring benefits to larger groups, because the product will be mainly used for children and refugees of study age, which consists of 55% of the population group in the camp (UNHCR, 2022). This project aims to find a suitable solution to tackle the problem of not having enough lighting for study in the refugee camps in Jordan. At the same time, the inequity in energy distribution should be reduced.

Research question: How to ease access to study opportunities for Syrian refugees by designing a suitable lighting product that can be used when there is no electricity being provided in the refugee camps?

To solve the problem, literature research analyses the context of the refugees, the inequity in energy distribution, and the use of lighting. After the final design is made, a semi-structured interview with the stakeholder is conducted to evaluate the design.

In the research phase, it shows that the contexts that are important to be taken into consideration while designing are the family structure, income status of the refugees, and the trauma they have been through due to the war. Besides, the current energy distribution in the camp contributes to the inequity of energy usage, the weaker grid connection in certain areas, and gender-based violence. The other activities of lighting used are the lighting for family activities, stores and shops, studying, and safety outside.

In the design phase, the lamp features an adjustable head, and a base has been designed. While the lamp is detached from the base, it can be used as a flashlight. Flipping over the base, it is where the solar panel is placed. While the lamp is used as a study lamp, the height of the lamp

can be adjusted and extended to a higher position. In the material selection and cost estimation, it is assumed that the quantity of 70,000 units will be mass-produced with injection moulding. The cost estimation takes the price of selected material into account and the cost of injection mould, machinery, labour, shipping, warehouse, and customs duty. It is estimated that each unit costs €18.33.

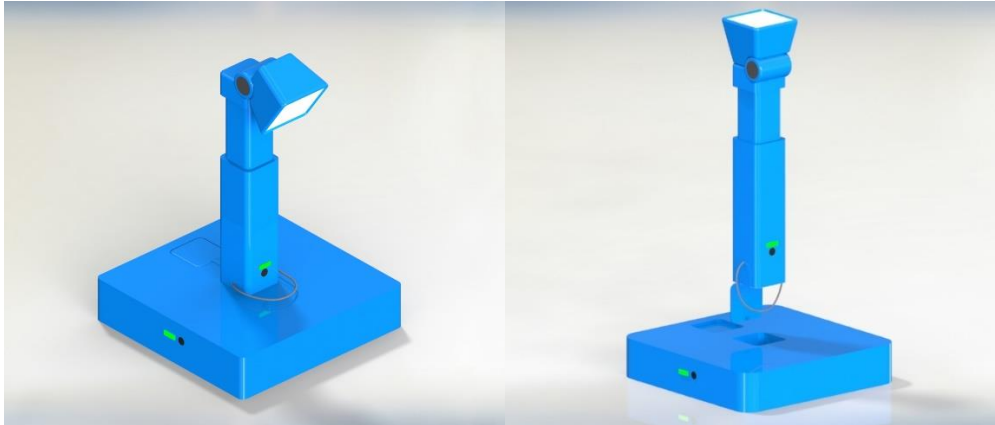


Figure 1: Lamp with the base

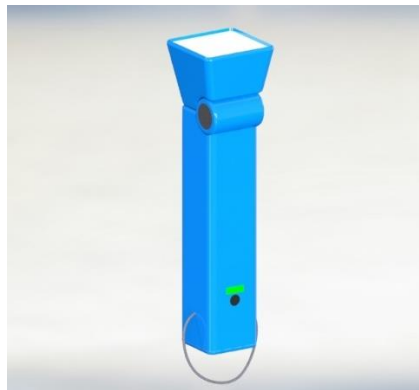


Figure 2: As a flashlight

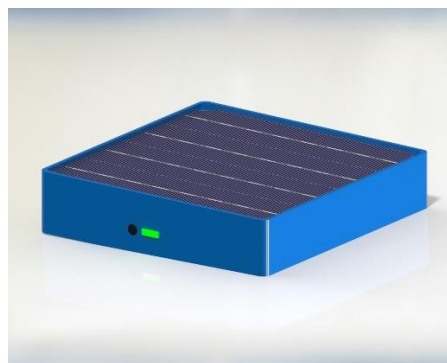


Figure 3: Solar charging base

In the evaluation, it shows that the aim of the project is fulfilled; the inequity in energy distribution can be reduced and the accessibility to study activities can be increased by using the product.

During the interview with the stakeholder, it is pointed out that the design is beneficial to the refugees. It increases accessibility to energy and study opportunities, and it also reduces the safety issue due to the lack of lighting. Moreover, the lamp has the potential to be used for different purposes. It shows that the product is suitable for the refugees in the camps. However, the prototype is not made yet, so further testing of the practicality and functionality, in reality, is hard to access. For the cost estimation, some hidden cost is not taken into consideration, so the final price might be a bit higher than the estimated one.

In conclusion, the research question has been answered. It shows that the design is suitable for the refugees in the camps, especially for study. For future research, more possibilities for the production and the material can be further analyzed.

References

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