Fostering Hope by Using Technology in the Azraq Refugee Camp, Jordan

Motivation

The 1950 Refugee Convention (UNCHR, 1951) states that refugees are among **the most vulnerable people** in the world. Motivated by a **huge need (over 65 mil. refugees worldwide)** and **few university-level learning opportunities** for students in refugee contexts, we designed an engineering course.

Our recently-completed course **taught engineering** skills to refugees living in the Azraq Refugee Camp in Jordan. We designed this course using tools validated by educational research to create an *active, blended*, and *collaborative* learning environment.

In this poster, we **describe our experience** and outcomes designing and implementing this course.

Course Objectives: empower learners with their own tools

- Fostering **engineering thinking** applied to solve local problems
- Developing **professional skills**
- Facilitating access to **higher education** coursework for refugee learners

Participants

- Participants were **men and women, tertiary students** aged from 18 to 50
- Students previously lived in Syria and were **forced to leave their homes** due to political conflict
- Some had **prior university coursework**, few in STEM area, and very **few in engineering area**

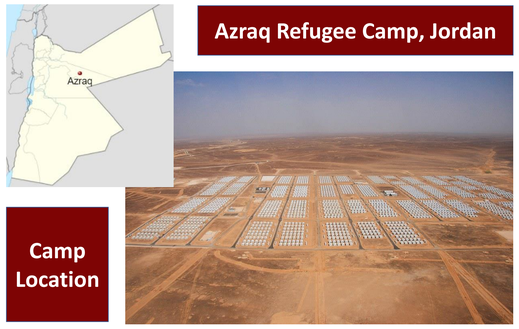
People of concern in Azraq: 53,285
Registered in the course: 44
Students selected: 28
Total of certificates: 13

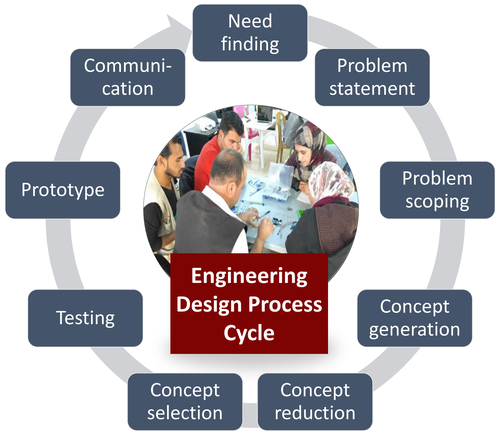
Inclusive Pedagogy in Designing an Engineering Classroom in the Azraq Refugee Camp

Class Structure/Approach

We co-designed the **content, assessment, and pedagogy** by considering the refugee camp context, community problems, infrastructure constraints, and learning objectives. We used students' ongoing feedback in **co-design** to **iteratively improve** the class while it was going on.

In this course, students learned the **engineering design process** as a tool for problem solving focused on local community needs.





We used a variety of Educational Technology Tools to fill diverse needs throughout the course

- edX educational online platform
- Arduino development board
- Computer and multimedia projector
- Whatsapp (online communication)
- Electronic devices, tools, and sensors
- Youtube videos
- Ebooks

WhatsApp ARDUINO YouTube

Outcomes: three student groups prototyped viable local solutions

Students developed their **analytical skills, engineering thinking, communication, and problem solving skills** as a result of taking this course.

By the end of the course, students created three different projects that addressed different local problems.

Problem	Project
Energy	Solar mosque – renewable power source for mosque
Recycling	Trash management system – Smart Truck
Environmental pollution	EconPro Environmental conservation

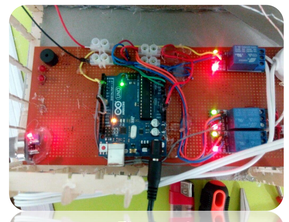


Figure 1.
Sensor control circuit

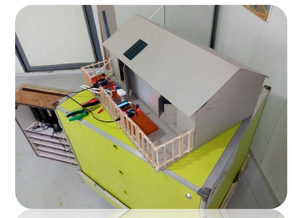


Figure 2.
EconPro prototype

Takeaways: human AND digital interaction were key

- **Daily interaction** with students through online communication and assignment feedbacks enhances their engagement in the course.
- An active, blended, and collaborative learning environment **facilitates knowledge** and understanding.
- Students can **develop engineering habits of mind** by learning in a culturally responsive environment

Acknowledgment

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More info

www.deboer-lab.engineer

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Authors

Jennifer DeBoer (PI)
Claudio Freitas
Jawaria Qureshey
Zach Beyer

Literature

UNCHR. (1951). Convention Relating to the Status of Refugees. Retrieved March 18, 2017, from http://www.unhcr.org/3b66c2aa10

UNHCR. (2015). Figures at a Glance. Retrieved March 18, 2017, from http://www.unhcr.org/figures-at-a-glance.html




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