



Engineering World Health 2020 Virtual Innovation Exchange Final Report

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Program Partners:

Rose-Hulman Institute of Technology

Notre Dame University of Lebanon

Lebanon American University

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Executive Summary

Due to the COVID-19 pandemic, Engineering World Health was unable to run our traditional Summer Institute programs. In response, EWH launched the Virtual Innovation Exchange, a 5-week online design program that brought together groups of students from the United States and Lebanon. This program was a general success. The VIE hosted 92 total participants from 23 different universities. 44 participants were from universities in the United States and 48 were from Lebanese universities. Participants were divided into 4 cohorts.

During the 5-week program, the participants worked in teams of 3-5. Each team included American and Lebanese students. The technical training comprised online lectures, virtual team assignments, and live sessions with team mentors. Each team developed a design which addressed a health need in a low-resource setting.

The participants **collectively produced 23 complete design projects**. Concepts ranged from water testing and filtration designs to mobile health apps to low-cost oxygen concentrators. Many designs addressed current needs driven by the COVID-19 pandemic, as well as needs within Lebanon. A design winner was selected from each cohort based on problem identification, design concept, implementation strategy, and project demonstration.

Our participant feedback was very positive: participants felt they learned a significant amount and enjoyed the opportunity to work in international and multidisciplinary teams. Participants appreciated the guidance of their mentors. All interviewed participants said they would recommend the program to a friend.

In summary, the Virtual Innovation Exchange was highly productive and an overall success. We are grateful to all who helped make this program possible.

Design Projects

EWH asked participants to identify a global health need and design a solution appropriate to low-resource areas. Through lectures, teamwork, and research, the participants identified needs and developed designs to address those needs. The groups completed a total of 23 projects. Here we will highlight the winners from each cohort. To see more design projects, watch the presentations [here](#).

Team 1.5 - Medical Equipment Management Platform

Team 1.5 did an excellent job of taking their project through the design process, presenting the need for their design clearly, discussing the system design, the user interface, and the steps for testing, implementation, and iterative improvements.

Team 2.4 - Low-Cost Battery-Powered Oxygen Concentrator

Team 2.4 addressed a need related to Covid-19, as well as other lung diseases including pneumonia. Their design aimed to improve on existing solutions by lowering costs and enhancing use through battery power.

Team 3.1 - The SeeingBelt

Team 3.1 designed a solution for helping the visually impaired navigate independently, called the SeeingBelt. Their project carefully considered the users' needs and ensured the functionality of the features to work for the visually impaired.

Team 4.5 - App to Support Children After Trauma

Team 4.5 addressed a need in Lebanon for improved access to mental health services through a smartphone app to support children after traumatic events. Their design was well-suited to the context for which it's designed and supported a neglected aspect of healthcare.

Participant Debriefs and Feedback

Our participant feedback was extremely positive this year. Some of the words used to describe the program were unique, invaluable, collaborative, exceptional, and

multicultural. Most participants found the most challenging part of the program to be the virtual aspect, either due to technical difficulties or a preference for meeting in person. Our post-program survey found that 97% of participants agreed or strongly agreed that they worked productively with people of different cultural backgrounds. Nearly 80% appreciated working in groups with diverse perspectives. The Facilitators received overwhelmingly positive feedback, with participants noting that their facilitator “was very encouraging,” “was very helpful,” and “provided technical assistance.”

Below are some comments taken directly from the participant feedback about the Virtual Innovation Exchange:

“Thank you for the opportunity! I learned so much in regards to designing for low-resource countries, having a global mindset, and working with students from all over the US and Lebanon. The experience was one of a kind.”

“We worked on international teams of Lebanese and American students to design and present a low-resource innovation that can benefit the healthcare and biomedical fields. Although this is not my field of work, I learned new concepts about conceptual design, functional architecture, technical feasibility, entrepreneurship, and app development. Thank you for this unique experience!”

“I really liked the VIE with EWH. It was really efficient and it was an experience to try again. It was a great experience.”

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