



**Engineering World Health Campus to Country
Nepal 2017
Final Report**

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Executive Summary

The 2017 EWH Campus to Country program in Nepal was a highly productive contribution to the Nepali health care system. This year we had 28 participants in addition to our three On-the-Ground-Coordinators. There were 15 male and 13 female participants, all undergraduate students. We had participants from 3 of the Nordic Five Tech Universities who represented 8 nationalities.

Before arriving in Nepal, the participants took a 3 week preparatory course at the Technical University of Denmark. Once in Nepal, the participants underwent 10 days of language and cultural training in Dhulikhel.

Once the training was complete, participants were placed in 13 hospitals throughout Nepal and collectively repaired over 200 pieces of equipment. Equipment ranged in complexity from ceiling fans to x-ray machines. Notable, high impact repairs include infant warmers, microscopes, nebulizers, and an anesthesia machine.

Participants completed needs finding interviews, plus other staff interviews and tasks to generate ideas for secondary projects and other potential solutions. This included completing inventories of medical equipment to allow hospitals to better organize their equipment donations and requests.

In summary, the Nepal program was highly productive and an overall success.

Types of Medical Equipment Repair

The 28 participants repaired 203 pieces of medical and hospital equipment, totaling approximately USD \$406,000 [1] of equipment repair service.

Repairs by Type of Equipment

Type of Equipment	Total Repaired	Type of Equipment	Total Repaired
Air Compressor	1	Microscope	7
Anesthesia Machine	1	Nebulizer	24
Aspirator/Suction Machine	12	Octoscopes	2
Autoclave	6	Oxygen Concentrator	12
Blood Pressure Device, Manual	11	Patient Monitor	3
Ceiling Fan	3	Phototherapy	4
Centrifuge (electric or hand operated)	7	Pulse Oximeter	13
Computer	2	Shaker Machine	1
Dental Drilling Machine	1	Thermometers	1
Drying Machine	1	Ultrasound machine (imaging)	4
EKG	13	Vacuum Extractor (for delivery)	2
Fetal Stethoscope	5	Water Bath (laboratory)	3
Incubator (infant)	2	X-Ray Film View Box	4
Infant Warmer (Radiant or other)	8	X-Ray Machine	0
Lamp, examination	11	Other	30
Lamp, surgical	9		

Secondary Projects

Infant Room Renovation

The participants painted the walls of the infant room (phototherapy room) with child motives and rearranged the room so that there was enough space in each division for an infant warmer. They removed three glass walls to allow for 3 large divisions, as opposed to 5 small ones. The work will hopefully provide the nurses with a more usable space and nicer atmosphere.



The infant room after the participant's work

New Workshop for BME

These participants completed several projects, the main one of which was building a workshop for the biomedical engineer in the hospital. They purchased and installed a shelf, built a corner-shelf, made a rack for tools, and purchased extra tools for the technician.

Improving Storage Rooms

The participants cleaned and organized two rooms to serve as proper storage rooms for broken and working equipment. Previously, this equipment was just placed outside, which usually caused further damage as it was exposed to the weather conditions. The participants worked in two separate rooms, one next to the workshop where repaired and working equipment is placed for pickup by staff, then another room used to store equipment that cannot be repaired at that time.

In addition, they organized the room that they had been working in over the summer so that it could serve as a workshop for the hospital's technician. They supplied the room with furniture, boxes for organization, and tools.

Sanitizing Stations

Here the participants made an affordable alcogel mix using rectified spirit and glycerin. They also installed wall dispensers so that the sanitizer can be utilized throughout the hospital. The participants instructed staff how to use it and how to make the mixture again for when the dispensers run out.

Cleaning the Storage Room

The participants here had a number of ideas for a secondary project, but ultimately decided to clean and organize the storage room and room used by the maintenance staff. These two rooms contain valuable spare parts and consumables which the staff did not previously know they had available. The hospital staff was very happy with the end result.

Curtain Hangings for Beds

The participants installed curtain hangings for the beds located in the ER. Previously, all of the beds had been together in a room with no curtains for privacy. The participants purchased the necessary supplies and installed the curtains with the help of the hospital's maintenance worker.



The newly installed curtains

LEGO Donation and Cleaning Storage Room

These participants completed a few secondary projects: cleaning and sorting 3 storage rooms, one day visit to Salyan PHC hospital to repair equipment, and a school visit and LEGO donation. The rooms were cleaned and sorted, including papers and manuals sorted and labeled. The staff is able to have easier and more efficient access to equipment and papers. For the hospital visit, they were able to repair 5 out of the 7 pieces of equipment that needed repairs.

Pillowcase and Stuffed Animal Donation

Here the participants sewed pillowcases in different colored and patterned cloths. They also made small dolls and teddy bears for the children in the pediatric ward. All in all, they were able to sew pillowcases for all 30 beds in the pediatric ward and 30 dolls/teddys. The pillowcases were sewn on the sewing machine while the dolls were all sewn by hand.

The instructor for this summer was Dr. Kaj-Åge Henneberg. The On-the-Ground-Coordinators were Tekla Larinkoski, Sunil Baniya, and Laxman Bhusal. Language and cultural training were handled by the Volunteer Society of Nepal (VSN). Classes were taught at the Technical University of Denmark.

[1] EWH estimates the mean value of each repair at USD\$2000