

“Approved Workers” – II Timothy 2:15

DOKIMO I ERGATAI

SPRING 2019

ROCK PROJECT IMPACTS HEALTHCARE IN KIJABE, KENYA



Leanne Tan '21

The ROCK (Rapid Orthotics for CURE Kenya) Project partners with CURE International to support and empower local orthopedic technicians in Kenya, as they implement and maintain a 3D printing system for the manufacturing of prostheses and orthoses at their orthopedic workshop in Kijabe.

One of the earliest projects the Collaboratory team worked on involved helping Kenyan technicians manufacture their own 3D printed prosthetic sockets. Prior to this, technicians took an average of three days to manufacture one socket as the process of making it was complicated and time consuming. A 3D printed socket, on the other hand, takes only about 12 hours to make.

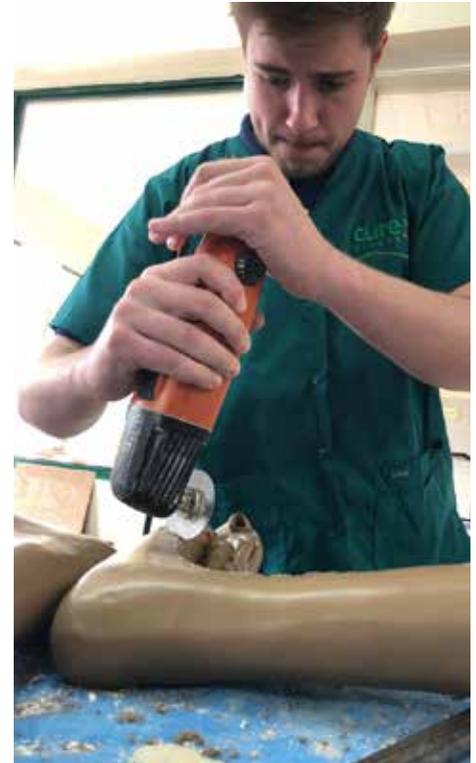
“With 3D printing, we can use a 3D scanner to scan the person’s anatomy and take that digital model to 3D print a socket that’s fit just to them,” project manager Dr. Emily Farrar says.

Currently, the team is running a series of tests (safety, compression and moment) on the sockets to ensure their overall safety and durability.

In addition to sockets, other projects they have worked on include manufacturing static and dynamic ankle foot orthoses, upper limb prostheses and rigid prosthetic hands.

In summer 2019, students will travel to Kenya. The team plans to help local technicians to manufacture their own dynamic ankle foot orthoses, find a process to manufacture rigid prosthetic hands with the 3D printing system and troubleshoot any systemic issues.

While impacting the lives of others, project members have also gained valuable experiences that have impacted their own lives. Student project manager Emma Vogan '20 shares that being in the Collaboratory has honed her leadership skills.



“I started off as a freshman on the team and I became the student project manager in the spring semester of my sophomore year. I didn’t really come into college thinking I was the type of person that was a leader at all,” Vogan says. “It was not a comfortable position, but I have had a lot of people help me along the way.”

Dr. Farrar is thankful for the opportunity to serve others through the project. “It’s been amazing to partner so closely with the staff in Kenya. Their passion for Christ and serving His kingdom drives them to serve their patients in such an amazing and wholehearted way. Through this project we get to participate in that,” Farrar says. “So, we’re sitting here at Messiah College in Mechanicsburg and we get to assist them in impacting these people, which, I think, is the beauty of Collab.”

Above left: A patient at CURE Kijabe gets fitted with a new prosthetic.

Above right: Thomas Pond '20 helps to make an ankle-foot orthotic for the orthopedic technicians in Kenya while they receive training on the 3D printer.

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THE COLLABORATORY
FOR STRATEGIC PARTNERSHIPS
AND APPLIED RESEARCH

WORD FROM THE STUDENT DIRECTOR

MISSION

The Collaboratory is a center at Messiah College for applied research and project-based learning, in partnership with client nonprofit organizations, businesses, governments and communities in our region and around the world. Areas of engagement include science, engineering, health, information technology, business and education. Our two-fold mission is:

- To foster justice, empower the poor, promote peace and care for the earth through applications of our academic and professional disciplines.
- To increase the academic and professional abilities of participants, their vocational vision for lifelong servant-leadership and their courage to act on convictions.

VISION

Increasing hope and transforming lives through education, collaboration, innovation and service.

IDENTITY

The Collaboratory is an organization of students, educators and professionals affiliated with Messiah College. We are Christians who aspire to obey the instructions of our Lord and Savior Jesus Christ, to love neighbors as ourselves and to share his Gospel. As God enables us to serve others today, we seek to grow as disciples of our Lord and Savior Jesus Christ, to serve as God's stewards over the resources of our academic disciplines and to bear witness to the good news of the Kingdom of God.

STUDENT STAFF

STUDENT DIRECTOR: Lily Gaudreau
 ASSISTANT STUDENT DIRECTOR: Erin Brenneman
 STUDENT PROGRAM MANAGER: Kally Tan
 STUDENT ADMINISTRATIVE ASSISTANT: Mik Fenn

PROFESSIONAL STAFF:

DIRECTOR: Doug Flemmens
 ENGINEERING PROJECT MANAGER: Dereck Plante
 PROGRAM MANAGER: Lori Zimmerman
 ADMINISTRATIVE ASSISTANT: Shannon Walker

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LILY GAUDREAU '19, STUDENT DIRECTOR

Colossians 1:15-20 discusses the supremacy of Christ over all things. This idea of supremacy, Christ reigning over and at the center of all things, is something that a devotional recently challenged me to explore. Was I really living in a way that acknowledged Christ's supremacy? Was I putting Him at the center of my life? I know that in my life I frequently try to assert control. I will fully give one area of my life to Christ, but I am hesitant to give Him everything. Christ can have my Sunday mornings, He can have my studies, He can have my friendships, but I want to have control over my aspirations for the future and ownership of my accomplishments.

This passage of Colossians highlights the error in that mentality. Shouldn't we feel comfort in the fact that Christ is over all things? Doesn't He know better than we do? This is a challenge for me and something that I need to continually remind myself. My desire for control over the future is primarily motivated out of fear. Christ died so that we no longer have to live in fear and assert His authority over the world. When I truly believe that Christ is in control, I feel peace and reassurance.

I will admit there are still times when I question Christ's supremacy - when I encounter injustice, sickness, tragedy or broken relationships. My heart breaks for those around the world without clean water, communities that have been refugees for over 40 years, and those suffering from disease. My position as the Collaboratory Student Director gives me a glimpse into the hope that comes with giving Christ control. Students are working on projects that demonstrate Christ's love in a broken world full of injustice and hurt. The Collaboratory is a constant reminder to me that I serve a good and faithful God that is over all things. He works through us in amazing ways when we turn over our lives, passions, gifts and abilities to Him. I hope that this verse will give you peace and encourage you to give everything to Christ as it has for me.

"He is before all things, and in Him all things hold together." (Col. 1:17) 

CUNNINGHAM BRACE COULD REVOLUTIONIZE A TREATMENT FOR CLUBFOOT



By Sara Mammano '19

Clubfoot is a common birth defect, affecting nearly 0.1 percent of children, according to March of Dimes. In the United States, families affected by clubfoot have easy access to treatment. However, in other parts of the world such as Kenya, the inability to access treatment for clubfoot leads to cultural marginalization. "If you have a deformity, culturally, it is a stigma. Clubfoot is a very treatable condition, but it takes up to five years [to correct] if treatment starts as a baby," states Professor Tim Howell, project manager of the Cunningham Clubfoot Brace project.

The Collaboratory partners with Jerald Cunningham, a board certified prosthetist and orthotist who developed a unilateral brace to reverse clubfoot. Cunningham's dynamic brace only needs to be worn on the foot affected by clubfoot. It is unique because of the helix piece that surrounds the



Above: Katie Prelog, student project manager of the team, puts the Cunningham Brace on a patient in Kenya.

Continued on next page

Cunningham Brace continued from page 2

calf. Not only does this allow for mobility, it is also easy to cover the brace with a sock and avoid cultural embarrassment.

Currently, the standard treatment in developing nations is the Ponsetti method using casting and a “boots and bars” brace. At about one month old, the patient gets leg casts to move the foot to its intended position. Boots must be worn on both feet connected by a bar for 23 hours a day for three to six months to maintain the correct position of the feet. Though this is an effective solution, there are concerns with compliance and it does not consider the immobility of the child nor the difficulty Kenyan mothers have carrying children wearing the brace.

The Cunningham Clubfoot Brace project uses a dynamic brace to create a more effective force distribution. This, along with improved mobility and lessened cultural embarrassment, promises to significantly improve user compliance. Student project manager Katie Prelog states, “Our site trips have been helpful to understand clubfoot and its treatment protocols as well as share our research on the Cunningham brace.”

Currently, the students are studying past success stories from the Cunningham Brace, establishing relationships with CURE International for clinical trials, and researching the relationship between the force of the brace and the foot. All of this work is being done to achieve recognition by the medical community and to change the way clubfoot is treated. Professor Howell states, “This specific treatment could revolutionize how clubfoot is treated while still being culturally sensitive. The Collaboratory being a part of that is amazing”



*Above left: Cunningham Clubfoot Brace
Above right: child with clubfoot*

REFLECTIONS FROM THE ECONOMIC EMPOWERMENT TEAM'S EXPLORATORY TRIP TO ALGERIA



Above left: Abdul hosted the team in his home. The team enjoyed lively conversation and delicious food. Above right: Economic Empowerment team meeting with community members.

The Economic Empowerment Team traveled to Algeria in January to visit a Sahrawi refugee community. We learned about micro-finance programs that already operate in the area and brainstormed with community leaders about how the Collaboratory’s community savings curriculum could bolster existing programming. In a series of long, exhausting, fulfilling days, we had the opportunity to eat lunch with a good friend of our hosts, Abdul (actual name is redacted). He invited us to his family’s tent, which was vibrantly decorated in shades of blues and reds. We all lounged on cushions lining the walls. Abdul immediately got down to business, sharing with us his desire to use his entrepreneurial talent to give back to his community.

Abdul tossed out idea after idea, some to offer employment opportunities to his friends and neighbors and others to facilitate trade between people living in different refugee camps, who have supplies to offer each other but may never know it. Full of ideas and questions, he explicitly sought our input, and so began an hour and a half

of brainstorming, asking questions and playing out different scenarios.

As we talked, others entered the tent, greeting us all before sitting down to conversations of their own. Someone else sat just inside our circle making tea, pouring over and over from one small glass cup to the next, creating the foam that showed how much they honored their guests.

Before we knew it, there were 25 people in the tent, and as our business conversation came to an end, we settled in to prepare for lunch. We were served savory orange soup with vegetables and rice, small pieces of grilled camel meat and camel hump on kabab, couscous with vegetable broth, and sweet yogurt for dessert.

We were deeply honored by the generosity of our hosts and were blessed by friendship and invigorated by conversation. Soon after lunch we left for our next meeting, but those hours – indicative of so many of our days – sitting together in conversation will carry our team forward as we prepare our community savings curriculum.



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STUDENT SPOTLIGHT

Autumn Bank '19 and Mary Roberts '19

“What has the Collaboratory taught you about leadership?”



Thomas Pond '20

Project: Rapid Orthotics for CURE Kenya (ROCK)

I learned how to work effectively with a team. I have had to learn how to work with my strengths and accept my weaknesses, as well as to understand when a task might be too much and to delegate the work.

as well as its challenges. As an introvert, it can be difficult to feel in control of situations; however, I have learned to step out of my comfort zone and effectively lead.



Ben Morral '19

Project: Pico Hydro

Leadership is sometimes about stepping back and letting others display their various strengths and abilities. God has given everyone a unique skill set, and to properly lead others is to direct them to use their gifts to the fullest.



Daria Eshelman '19

Project: Sustainable Agriculture

Collaboratory taught me a lot about the different types of leaders and skills that are needed to work together in an organization. As a more introverted person, I did not always think of myself as a leader because I am not always the most outspoken person. Being on the Collaboratory's Student Board has shown me that there are many different ways for a leader to contribute to and flourish through service.



Mary Roberts '19

Project: Marketing

The Collaboratory helped me understand different aspects of leadership,

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