IEEE Eta Kappa Nu Service After Graduation

Can STEAM education help lift developing nations?

Is promoting science, technology, engineering, arts, and mathematics (STEAM) education enough to lift a country out of poverty? How do you promote STEAM instruction in rural schools with a lack of laboratory supplies, no electricity, and pervasive gender stereotyping?

STEAM education can have a significant impact on moving people out of poverty and promoting gender equality if used with the proper cultural, gender, and economic sensitivity. The U.S. Peace Corps, in partnership with the Lesotho Ministry of Education, hosted its first-ever STEAM Camp for 66 students from 11 high schools in the Kingdom of Lesotho, a landlocked country in southern Africa.

STEAM Camps aim to expand the number of youths who pursue advanced degrees and careers in STEAM fields, promote STEAM literacy with hands-on training for educators, and broaden the participation of women and minorities in the area's workforce. The main goals are to combat the lack of teaching resources, address the culture of difficulty around these subjects, mitigate a general lack of knowledge regarding STEAM careers, and provide STEAM education in rela-

tive proximity to the students' homes, thus reducing the "brain drain" effect. Valuable human capital can stay in the country and stimulate economic growth there rather than migrate to a region with greater wealth.

Gathering STEAM for Economic Growth: A Story of Service

People in the mountainous Kingdom of Lesotho are working hard to edu-

cate the next generation of their workforce in STEAM-area disciplines but not without encountering many hurdles. With students walking hours to school, a lack of teaching resources, and sometimes less-than-ideal weather conditions, Lesotho students are still expected to compete neck and neck with others who have more material assets. Despite these obstacles, the flame of the determination to succeed burns brightly in Lesotho.

As we gathered input from teachers from around the country, the concerns came pouring in. What if new curricula do not translate well into their mother tongue? How can we motivate uninterested students? What if we don't have the equipment needed to explain this topic? A physics teacher in one of the southern districts explained, "The problem is the children aren't interested in these classes. They can't see what is happening because we don't have the supplies, and there's a culture of difficulty

Campers on Day 1 of STEAM Camp, focusing on science through a density experiment using local materials of honey, dish soap, and paraffin.

KAYLA NINH.

Campers along with STEAM team faculty advisors and U.S. Peace Corps volunteers at the end of the Closing Ceremony at the camp.

around these subjects. We need to change attitudes."

Leading a team of seven U.S. Peace Corps volunteers in Lesotho, I helped craft a teacher training and camp program for the country. Curricula and resources were designed and tailored to the local conditions. The schools were brought into the process to build support for our STEAM-themed activity. It began with a two-day workshop for 12 advisors from all of the schools in attendance, with the goal of discussing how to overcome the challenges of teaching STEAM with limited resources, language barriers, and lack of interest. Teachers also were trained on such topics as the growth mind-set, and a STEAM guidebook was created, detailing different activities that can be completed in rural environments with few to no demonstration supplies.

The camp spanned five days, with each morning focusing on the importance of one of the letters in STEAM, for example, on "E" day, building the tallest free-standing tower using only straws and tape. Afternoons were filled

Students rapidly took to technology, even those who had no previous experience with computers.

with work on a weeklong group project, "Build a Bridge!" It emphasized how these topics intersect, ranging from setting a budget to prototypes.

Multiple professional organizations also took part. The Girl's Coding Academy introduced Scratch programming. The Morija Art Center taught felt making using local materials. The Bethal

Business and Community Development Center explained solar energy systems. The list seemed endless. Some students touched a computer for the first time, others had no idea what engineering was, and some even learned how to code without any technology at all. In a truly inspiring moment, within 15 min, students who had no previous

exposure to computers were working at the same pace as students who accessed them weekly.

The results were astounding. Students were exploring previously unheard of concepts. Every one of the 66 students improved in at least one area of STEAM knowledge, and all 10 teachers reported feeling more confident in teaching STEAM-related subjects. The camp was documented and designed to be continued in future years, making it possible to apply the camp format in other developing countries.

The STEAM Camp gave teachers, students, and organizations with a passion for these disciplines the opportunity to gather for a week and ignite a flame that will hopefully last for years to come. This effort could not have been possible without my experience with IEEE Eta Kappa Nu (IEEE-HKN), the U.S. Peace Corps program, and the extremely inspiring and powerful STEAM-minded teachers and other Peace Corps Lesotho volunteers.

A Personal Perspective

"On our way to the impossible, we might just find something eminently doable."

—*NASA*

HKN is founded upon a commitment to service, a value that I tried to instill into others during my time with the Gamma Theta Chapter at the Missouri University of Science and Technology (Missouri S&T), and it is something that I still remind myself of every day. In the tech world, it's easy to forget the struggles of others, whether they are of another gender or another culture entirely. My experience of service with HKN and STEAM disciplines at Missouri S&T were incorporated into my drive to turn words into actions and solutions.

I believe this story will inspire younger STEAM professionals like myself, who may come from a small college town, are first-generation college students, or are first-generation Americans, to use our privileged college experience to find a way to help in the world. Keeping cultural diversity in mind and using the right tools, we can find ways to weave cultures from all around the world with the spirit of discovery through STEAM education.

STEAM instruction alone cannot lift a developing nation. But with the hands of generations of teachers, students, and other helping nations, the margins of international disparity can begin to shrink. An HKN member should live out the value of volunteerism and service while a student and continue such activity as a professional. Whether the service is across the globe in a developing nation or in your local community, you have the ability to make an impact.

Author's note: The views expressed in this article are the author's own and do not represent the views or opinions of the U.S. Peace Corps.

— *Kayla Ninh*

Partners in Scholarship, Character, and Attitude

IEEE affiliates expand at the University of KwaZulu-Natal

The three tenets of IEEE Eta Kappa Nu (IEEE-HKN)—scholarship, character, and attitude—have taken hold at the University of KwaZulu-Natal (UKZN) in South Africa as the IEEE-HKN Mu Eta Chapter and the university's IEEE Student Branch joined forces to grow student involvement, foster academic excellence, and impact their community in a greater way. This partnership has been so successful that the combined membership of the Mu Eta Chapter and the IEEE Student Branch is now the third-largest IEEE student entity in IEEE South Africa.

Over the last two years, the UKZN HKN Mu Eta Chapter and UKZN IEEE Student Branch grew from just a few participants to nearly 30 active members. The recently established HKN chapter and the pre-existing IEEE Student

Branch have worked closely together to take advantage of academic excellence and leadership development opportunities promoted by IEEE-HKN and the Student Branch, respectively, and increase IEEE activities and their attractiveness at UKZN.

Led by HKN member Shaun Barnett, plans were set in motion to rekindle the Student Branch. Working closely with the previously established IEEE HKN Mu Eta Chapter, the Student Branch strove to bring the knowledge and benefits of IEEE membership to the greater student body. The branch endeavors to inspire students and enrich their experience to the benefit of their communities through collaboration with organizations on relevant events and opportunities. Furthermore, it was only through close cooperation with the Mu Eta Chapter Executive Committee for 2018 (President Sulaiman Patel, Vice President Dauda Ayanda, Treasurer David Parker, Corresponding Secretary Mary Ahuna, and Recording Secretary Naymah Adnan) that traction could be gained in the direction of reactivating the UKZN IEEE activities.

Motivating the Next Generation of Engineers

For IEEE Day celebrations in October, Dr. Upasana Singh organized Women in Technology and Engineering Careers talks for more than 200 local high school female students. IEEE Student Branch and Mu Eta Chapter members Dauda Ayanda and Naymah Adnan spoke at the event, aimed at inspiring young women to enter these fields. You can learn about other activities the UKZN HKN Chapter and Student Branch sponsored by reading *The Bridge* at www.hkn.org.

Preparing Students for the Job Market

One of the IEEE affiliates' successful joint endeavors was a Skills Development Workshop, aimed at preparing students for the job market. Dr. Han van Loon, a knowledge management expert from Switzerland and a representative of several international standards-setting bodies, was the guest speaker and