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Students Engineer Solution to Public Health Issue in Dominican Republic

Student chapter of Engineers Without Borders dispatches to rural village to build invention that replaces open-fire cooking



March 16, 2016 | Jill Rodrigues '05

Valle Nuevo, Dominican Republic – For their inaugural service project, Roger Williams University’s Engineers Without Borders student club traveled deep into the mountains of northern Dominican Republic last week to provide a design solution for a serious public health issue.

Their task was to replace open-fire cooking – which has been causing chronic respiratory illness in women and children in Valle Nuevo – with an inexpensive, efficient method that channeled smoke outdoors. It was an effort that kicked off last fall via the [Foundation for International Medical Relief of Children \(FIMRC\)](#), which matched the club’s expertise to a community need at one of the nonprofit’s project sites around the globe.

The group had spent months designing improvements to a traditional wood-burning cook stove and testing full-scale prototypes at the homes of club members. Now, prepared to put boots on the ground and launch their invention, five of the group’s students – engineering majors Briana Tremblay, Andrew DelSanto, Stephanie Gratiano, Madison Newton and Yazmeen Shahin – dispatched into the field, accompanied by faculty advisors, to raise their concept from theory to application in the real world.

“This wasn’t a case of volunteers going in and just doing whatever they wanted to do,” according to Tremblay, president of Engineers Without Borders and a mechanical engineering junior. “FIMRC had identified the need from the community, and we had a lot of help and input along the way from the locals.”

Each day for a week, they’d depart from their host families in Restauración to journey by truck into the rural mountain village composed of wood-and-tin-roof houses set along a two-mile dirt road. Furnished with their requested materials by FIMRC, the students were prepared to lead work teams with assistance from the local Dominicans and Haitians.

From the start, they ran into challenges they hadn’t encountered back home. The aluminum for the chimneys came in sheets and had to be stapled into tubes. The sand was much grainier than they were used to, which required adding water and cement mixture in order to get the bricks to adhere. And when a local man informed them that the rainy season would douse the cook-fires through the chimney, Tremblay said the students devised a “birdhouse-like” cap that covered the chimney hole but allowed smoke to escape through the sides.

“This project gave us the opportunity to apply our knowledge in the field,” said Madison Newton, a junior civil engineering major. “In the field, in a foreign country, you have to solve things on your own – you can’t rely on teachers to tell you what to do. It not only shows you what you’ll be facing in the work field, but also what you’ll experience in real life.”

As they built eight cook stoves throughout the week, the students immersed themselves in the community, playing soccer and tossing a rugby ball – three students are on the RWU Women’s Club Rugby Team – with the local children; experiencing the local cuisine; and working with regional tradesmen and FIMRC representatives to teach them how to construct their design. Even the children had a hand in the project, taking up a trowel to spread cement and laying brick for the stove base.

For the student-engineers, the most meaningful part of the project – which was a volunteer effort and not undertaken for academic credit – was the community involvement. They left behind illustrated instructions and material to build an additional cook stove.

“This was an experience that not only enhances your education through real, hands-on work, but you also learn so much about yourself and grow as a person,” Tremblay said. “We did this project for ourselves and for the community of Villa Nuevo.”