It happened at 2 A.M. one morning last summer on North Beach on Northwestern’s Evanston campus. Yuri Malina was sitting in the lifeguard chair. Mert Iseri was building a sand castle. They didn’t talk; they stared at the lake. The two young men were discouraged: For the past several weeks, as part of a project for the new student group Design for America, they had observed hand-hygiene practices at Evanston Hospital (part of the NorthShore University HealthSystem).

They were trying to figure out solutions to a universal health-care problem: design a way to make hand washing more consistent among health-care personnel. Studies show that less than half of health-care professionals in the United States wash or sanitize their hands as often as they should, and previous efforts at hospitals across the country hadn’t worked.

The Design for America group had observed doctors, nurses, and hospital staff in the ICU for hours on end in order to develop insights about hand-hygiene practices; they took notes, went home, and considered the possibilities. The entire project team had vowed not to share any insights with each other until the observation period was over, but Iseri (industrial engineering ’11) and Malina (integrated science ’10) — who met last year in their residence hall and lived together over the summer — would often turn to each other on the couch at night, interrupting the TV show they were watching, to share ideas that could not be contained.

But none of their ideas seemed right. It was an unusual setback for members of Design for America, which had won a top prize in a nationwide design competition shortly after it was formed. It was an unusual setback for the two young men who, over the past several months, had become so passionate about design that they would interrupt each other with escalating excitement when talking about process and possibilities.

So late one night they walked to the beach and sat, looking at the lake. Finally Iseri stood up and rubbed his hands together. With this single motion, the fleeting spark of an idea struck. The two young men rushed to their design space in the Ford Motor Company Engineering Design Center and went to work. They wouldn’t share the idea with their teammates for a while. “You have to take a good idea and park it away so you’re not locked into it,” Malina explains. Ultimately the idea — a personal hand-hygiene device — would become the cornerstone of a suite of solutions the team presented to hospital administrators. At the time, it was the motivation they needed to keep going.

Creating a new kind of organization

The idea for Design for America came to Liz Gerber shortly after she came to McCormick as an assistant professor of mechanical engineering in fall 2008. She realized there was an opportunity to direct students’ excitement for design into local and social change. In a meeting with Dean Julio M. Ottino, she brought up the idea of the group. “What is that?” Gerber recalls the dean asking.

Gerber quickly laid out plans for a service-based design program similar to Teach for America and sent it to a few friends for their feedback. “My colleagues thought it was great,” she says. “I got such an enthusiastic response — with offers to do whatever they could to help launch the program — that I thought, yes, there is something here.”

Within just a few months dozens of students were on board and the group had won an award in the DiabetesMine.com design challenge, which asked teams to create tools for improving the lives of people with diabetes. The Design for America team created Jerry.
“Design for America offers students an opportunity to build strong belief in their capability to use design to impact the world in a positive way.”

LIZ GERBER

the Bear with Diabetes, an interactive stuffed toy and web site for children with diabetes. From there, the opportunities were abundant. Where to start? Which projects should they do? Which projects shouldn’t they do?

“We have an agreement,” Gerber says. “As long as the project satisfies the DFA mission, which is one of social and local impact through design, they can do it. Students were considering helping a theater find ways to improve ticket sales, but then they thought perhaps the impact wasn’t local, or lacked social impact.

Last summer Design for America started a summer fellowship program called the Design for America Summer Fellows Studio, in which students were hired to work on one of three projects: improving hand hygiene practices, creating micro流al interventions, or improving emergency department, improving retention for an urban youth development program, and improving methods to engage at-risk teens for a community center.

Mathew Iseri and Hannah Malina, along with Hannah Chung (mechanical engineering ’12) and K. C. Porter (psychology and global health ’12), chose to work on the hand-hygiene project.

Focusing on hand hygiene

According to the Centers for Disease Control (CDC), no single intervention has effectively improved hand-hygiene practices. As early as the 1820s, doctors and scientists realized that hand hygiene could help prevent the spread of infectious diseases. More than 30 years ago the CDC created formal guidelines on hand-washing practices for hospitals that recommended hand washing with nonantimicrobial soap between the majority of patient contacts and washing with antimicrobial soap before and after performing invasive procedures or caring for high-risk patients. While compliance with these guidelines varies from ward to ward and hospital to hospital, CDC studies show that today, less than 50 percent of workers are compliant with hand-hygiene standards—even though research shows that improved hand hygiene can lower the risk for health-care-associated infections and outbreaks of resistant bacteria.

Given this background, the students vowed to look at the problem with fresh eyes. Over the next six weeks they were charged with observing hospital practices and creating solutions to the centuries-old problem. Wherever you work in engineering and design, you’ve heard a band of constraints,” says Jeanne Olson, a lecturer in the School of Education and Social Policy, a design consultant, and team coach for the project. “You can view them as crippling or you can view them as fueling to creativity. Time was one of our biggest project constraints; OSHA issues and hospital workflow provided another set of problem constraints. All of these forced us to get really creative.

After a series of boot camps with design professionals, the students spent these weeks observing doctors, nurses, and hospital staff.

That meant three weeks of long shifts, late nights, and, most important, no discussion about possible solutions within the team. This self-imposed silence was also critical to thoughtful observation of the work of hospital staff. “You don’t talk,” Malina says of his experience as an observer. “You act like wallpaper.”

Sara Levinson, infection control practitioner at NorthShore University HealthSystem, was instrumental in championing the project and acted as a liaison between the team and the staff, addressing logistical concerns and helping to facilitate work with hospital stakeholders. “Their minds never stopped,” she says. “They carried these little notebooks with them, and they were always jotting down different ideas.”

“In observations, nothing should be too boring or miniscule,” Olson says. “I would ask, ‘What did you notice about the patient’s room?’ Where do people’s eyes go? Where do their bodies gravitate? What do you notice about the hand-sanitizer dispensers?” To that someone replied. “They are the same color as the wall.” So, how does that affect the hospital staff’s interaction with a dispenser? I’m there to ask questions and give advice if the students need it, but they are conducting the research. They are developing and testing ideas.

In addition to observing, the team talked about why people might not wash their hands when they get busy, they forget, the hand sanitizer makes their skin dry. The team also talked about identifying what are referred to in the design world as “positive deviants”; people who do wash their hands without fail. Who were these people, and why did they do it?

Was there something to leverage there? Eventually the group came up with a dozen ideas. How about a timed device that squirts sanitizer on people’s hands every three minutes? What about latex gloves filled with hand sanitizer? “What if we don’t give them a choice about sanitizing their hands?” Malina wondered.

“Forty per cent of us gave them the choice.”

With the observation stage completed, the group met in its small office in the Ford Motor Company Engineering Design Center, where drawings and notes cover the walls and pens, markers, and an endless supply of candy and cookies cover the center table. They argued over what to do next. Chung wanted to create prototypes. Iseri wanted to go back and do more observations. Things got heated. Malina was silent, in thought.

“Yuri has a quiet, scientific mind,” Olson says. “He was really terrific at observing the team and taking care of all of the things we group in terms of relationships, what needed to get done with project management.”

At that moment Malina got things done. While Iseri and Chung argued, Malina left the room and came back with a crude prototype of their main idea—the personal hand-sanitizing system Malina and Iseri had come up with that night on the beach. He put it on the table. Both Iseri and Chung—weaved to Olson to have given a Playmobil hospital room for her birthday because, as Olson says, “I could tell she really wanted to build something because being able to touch something was important to her creative process.”—were quiet. Malina had figured out how to move the group past its impasse: They could get busy building quick, imperfect prototypes and still collect observation data.

A bundle of hygiene solutions

The group ended up with a “bundle” of hand-hygiene ideas for the hospital: trays to place above sinks and sanitizer dispensers so doctors and nurses had somewhere to set their things while they wash their hands, a curtain rod that can easily be cleaned so doctors and nurses don’t have to use their hands while opening a patient’s curtain (that can’t so easily be cleaned); hand-hygiene screen savers for hospital computers as constant reminders for staff, and new stickers for foam sanitizer dispensers designed to catch the eyes of people walking by. The bundle also included the personal hand-hygiene device that was the object of the revelation on the beach; students are still working out the details of the device, however, the particularity will remain a secret for now.

Hospital administrators were impressed by the bvy of ideas that ranged from easy-to-implement solutions to those requiring more research and prototyping. “They really listened to the stakeholders’ concerns,” says Levinson. “Everybody was really excited about the different ideas, and the students’ energy was infectious—in a good way.”

NorthShore is considering and discussing a number of the ideas. They decided against placing shelves over hand-sanitizer dispensers—they tended to decapitate the nurses who were shorter.” Levinson says, but are considering the screen saver and the new curtains and curtain rods. “We really enjoyed having the students here,” Levinson says. “We foster innovation, we foster learning, and we address problems, and these are common values that the Design for America students have as well.”

These values also provide a space for interdisciplinary collaboration at Northwestern. Olson says, “For many reasons, it is often difficult for higher education institutions, especially research institutions, to foster this type of work across areas of study and schools. For this project, an industrial engineer, a mechanical engineer, a global health student, and an integrated sciences major had to combine their different interests in order to tackle a problem. Liz Gerber’s enthusiasm for involving professionals from the design community and from different programs at Northwestern created a rewarding experience for the team as well.”

Organizing for the future

A year into its existence, Design for America has had its share of ups and downs. It recently won a Social Designer competition with a coloring book based on basic human emotions, but it failed in an entrepreneur- ship competition due to lack of a sound business plan.

“If you only succeed, you don’t learn,” Gerber says. “A failed experience is okay as long as there is reflection. The thing I am most proud of is that [the students in the entrepreneurship competition] took time to reflect about what they would do next time. The ability to reflect and learn is critical to their success.”

The next challenge for students in Design for America is designing their own organization. They need to organize their processes: At meetings students can sometimes still try to talk over each other—or yell. “If you do it,” (an adage posted on the bulletin board). And then’s been interest from other schools that want to start chapters. Students are beginning to decide who will lead and how. “This will only succeed if it is student led,” Gerber says. “Design for America offers students an opportunity to build strong belief in their capability to use design to impact the world in a positive way. The less involved I am, the more they develop that capability in themselves.”

The students are doing exactly that. Three members of the hand-hygiene team spent all or part of their childhoods in other countries (Iseri in Turkey, Chung in Korea, and Malina in France), and they take their mission to design for social impact as a serious responsibility. “America is a country where people are welcome to do something for the greater good,” says Iseri. “America enables us to do this.”—Emily Ayshford 16