

This virtual reality surgery lab helps train students before they face real patients

August 31 2022, by Adithi Ramakrishnan



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In an empty room with four gray walls, black projectors near the ceiling whirl to life. In an instant, the space transforms. The possibilities are endless: a quiet living room with flames spilling out of the fireplace. A

dense forest populated with lush green trees. The interior of a hospital emergency room.

The projections on the walls of the 2D virtual reality room are vibrant and immersive. They're also vital to the education of students at The University of North Texas Health Science Center at Fort Worth. The virtual reality rooms are located inside HSC's brand-new Regional Simulation Center, which held its ribbon-cutting ceremony at the end of June.

The simulation center was established to give medical students hands-on practice with techniques and situations they'll have to tackle in real-time once they leave the classroom.

Karen Meadows, the center's director, said the space boosts students' confidence by allowing them to practice tricky skills and quick decision-making in an environment where they're allowed to make mistakes and get feedback.

"It's the bridge between what happens in ... an education environment, like a lecture," said Meadows, "and going out into the clinical environment, and laying your hands on a real patient."

Practice makes perfect

The Regional Simulation Center is located on the first floor of HSC's Gibson D. Lewis Library, a central location on campus.

The 16,000 square-foot space includes a 3D virtual reality room, the 2D room, mock doctor's office rooms for medical examinations, a "home suite" for physical therapy practice and more. The space also has several lifelike mannequins that students can use to practice physical exams, medical procedures and even birthing.

The brand-new center has been two years in the making. Meadows says HSC used to have a 5,000 square-foot simulation center in a different building, but as the need for hands-on [medical training](#) grew, the campus outgrew the space. The new center is much larger, has more advanced virtual reality capabilities and can be used by students and health care community members alike.

Jamie Park, an assistant professor in physician's assistant studies at HSC, says she had minimal access to simulations during her own medical training, and had to pick up several cues on the job. "I learned in real time, with real patients," Park said. "And there were lots of bumps and bruises for all involved."

Park is passionate about preparing her students for the day-to-day life of a medical professional, as well as for the complex situations that can be hard for a new [student](#) to navigate.

She's currently designing a simulation for her students which she calls "Delivering Bad News." In it, students have to compassionately convey to simulated "family members" that something has happened to their loved one.

Following a simulation, students get feedback from instructors like Park and the simulated patient actors on what they did well and how they can improve. Students learn to be more empathetic with a patient, or to change their wording to make a medical procedure clearer.

"This is OK, to make a mistake here," Meadows said. "You're going to walk away with every bit of dignity that you came in with, plus you will have learned something new."

In the center's 3D virtual reality room, students put on a pair of black 3D glasses and use a handheld remote to interact with different

environments.

In one simulation, called the Room of Hazards, students are immersed in a child's hospital room and have one minute to click on up to 19 objects that don't belong in the space—like trash on the floor or a needle on the counter.

Meadows said with a bit of programming, the room has limitless potential. She envisions creating a 3D model of the heart where students could "walk" through the organ themselves, following the flow of blood.

Running medical 'drills'

Students say they benefit from simulation training. Samantha Skipton, a third-year student at the Texas College of Osteopathic Medicine on HSC's campus, said students can practice [medical procedures](#) like intubation in the 2D virtual reality room. The walls can be projected to look like John Peter Smith Hospital, where the students complete their in-person medical rotations.

"To be able to have the exact environment, to a T, I think really makes a difference in how you can remember everything," Skipton said. "And it just puts you in that environment when you're practicing."

Meadows said she can make the 2D virtual reality room look like any place she can film with a 360-degree video camera.

Danielle Smith, another third-year student at TCOM, said [simulation](#) training in medical school is a bit like being on a sports team. Students practice critical skills every day so that when a real-life situation comes around, those skills have become second nature.

"You just run drills over and over again, until, you know, we're going to

throw that pass in a split-second decision," Skipton said, "[and] you know your teammate is going to catch it."

Simulation for the community

The center can yield benefits to community members as well as students. Meadows said local workers involved with emergency medical services, hospitals or physical therapy are welcome to book the space.

The center's "home suite," for example, is designed to resemble a patient's apartment. Professionals can practice helping someone out of a bathtub or into their bed.

Park even sees a benefit for construction workers down the street from HSC. She wants to develop a job-site medical training where workers can practice helping injured colleagues should a dangerous accident occur.

She said a few years ago, her husband, who is an architect, had a construction accident happen at his place of work. Her husband wasn't sure what to do in the crisis situation and Park, who practices emergency medicine, wasn't there to help. Park said the incident significantly impacted both of them.

She sees an opportunity to turn the Simulation Center's benefits outward and improve medical training for a wider group of people—so that if a real-life situation comes about, they feel more ready to act.

"To think about preparing our community for difficult situations, to empower them?" Park said. "It's really exciting."

2022 The Dallas Morning News.

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Citation: This virtual reality surgery lab helps train students before they face real patients (2022, August 31) retrieved 28 June 2024 from <https://medicalxpress.com/news/2022-08-virtual-reality-surgery-lab-students.html>

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