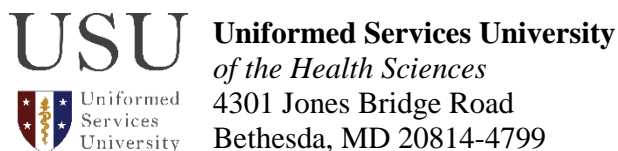


Learning to Care for Those in Harm's Way



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Contact: Sarah Marshall, Office of
External Affairs

Email: sarah.marshall@usuhs.edu

Military Kids Use Virtual, Augmented Reality to STEMulate Learning

Bethesda, Md. – Donning high-tech virtual and augmented reality simulators, while testing out revolutionary modular prosthetic limbs and interacting with experts in the field of science, technology, engineering, and math, a group of about 23 middle school-aged military children had a chance to learn inspiring and exciting lessons during a two-day workshop June 3-4 at the Uniformed Services University of the Health Sciences (USU).

The workshop was recently launched by the Johns Hopkins Applied Physics Laboratory (APL) through a grant from the Office of Naval Research (ONR) and is referred to as CONVEY – Connecting STEM Outreach Now Using VIE Education for Youth. VIE, or Virtual Integrative Environment, was developed by APL as a training platform to help amputees adapt to using advanced brain-controlled prosthetic devices. Led by prosthetic experts from USU and APL, CONVEY was established for children of military service members to help them gain a deeper understanding of the healing process of an amputee, while learning about science, technology, engineering, and math (STEM) topics. The workshop was also designed to cultivate an emotional connection unique to these children in hopes of motivating them to pursue STEM careers.

Working in pairs, the students played interactive games that taught them about STEM topics, including physiology, human anatomy, the brain, nervous system and muscular system. Wearing the Hololens and Oculus Rift -- virtual and augmented reality headsets -- they were able to “see” a virtual brain in front of themselves, and examine each of its lobes and functions. They tried on Myo armbands – devices that allowed them to control the APL’s Modular Prosthetic Limb as well as virtual prosthetic limbs to better understand a new and developing technology helping amputees gain independence. The students also explored electronics by using circuits, along with lights, motors, and buzzers, bringing them to life by connecting LEDs or battery packs that ran currents through modeling clay. The workshop culminated in a lively and entertaining virtual-reality competition, which also helped evaluate what they had learned.

Lucille Kistner, one of the students who participated in the workshop, was particularly excited about using the virtual and augmented reality equipment because it allowed her to “feel what it’s like to have a bionic arm or prosthetic arm,” she said. She explained how the Myo band allowed her to maneuver a virtual arm while playing ping pong, and as the virtual arm responded to her muscle movements, she could hit the ball back and forth.

“It’s all related to your brain, so that’s cool,” she said.

Lucille is interested in a career in the field of science, she added, and is inspired by how this technology will help make a difference for so many people.

“It was really fun,” added Noah Hutchinson, another student who participated in the workshop. He enjoyed wearing the Myo armband, too, experiencing for himself how the device responds to muscle movements. He was also inspired by how this technology will help amputees do more independently, and therefore have a better future.

Dr. Paul Pasquina, professor and chair of USU’s Department of Physical Medicine and Rehabilitation and chief of Rehabilitation Medicine at Walter Reed National Military Medical Center, helped organize the workshop. Having been a leader in the field of prosthetics and amputee care for nearly two decades, sees great promise in the STEM workshop.

“While there have been significant advances in medical, surgical and rehabilitative care over the past decade, the challenges that our patients and families continue to face are constant reminders that more work is needed,” Pasquina said. “It is our hope that the CONVEY workshop will inspire future generations of scientists from a broad field of disciplines to help solve some of these challenges and contribute to an improved quality of life, not only for our men and women in uniform, but for society as a whole.”

Dwight Carr, APL STEM program manager, added that CONVEY is also designed to use the virtual training platform to enhance each child’s understanding of how STEM concepts are being used to help individuals gain independence, mobility, and human interaction with loved ones.

“It’s an engaging and interactive way to expand the use of the technology, while helping both the service members and their families,” Carr said.

Dr. Peter Squire, program officer in ONR’s Human Performance Training and Education office, added it’s important to be thinking, now, about the capabilities that will be needed in the future, while building the workforce of the future.

“This is a good opportunity to understand how science impacts prosthetics, to better understand the way they use science, and to think about what things you can do today that may impact folks tomorrow,” Squire said.

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About USU

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are supporting operations around the world, offering their leadership and expertise. USU also has graduate programs in biomedical sciences and public health, most open to civilian and military applicants, and oral biology, committed to excellence in research. The University's research program covers a wide range of clinical and other topics important to both the military and public health. For more information about USU and its programs, visit www.usuhs.edu.