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Link

Robotics Camp Helps Kids Explore Careers in Technology

There are roughly 29 million working age Americans with disabilities. Yet of this population, 67 percent are not in the workforce. It is a phenomenon that can be explained in any number of ways,

from the lack of safe, reliable transportation to inadequate workplace accommodation.

Another reason, says Sondra Balouris Brubaker, Executive Director of the Tech-Link Program of Pittsburgh, is lack of exposure to career options at a young age. “There is growing evidence that children with disabilities don’t receive encouragement to explore a variety of job options when they are in their most formative years,” she explains.

Tech-Link and other programs like it hope to change this situation. The nonprofit’s mission is to introduce children with disabilities to careers in math, science, and technology. Typically, the program organizes work-site visits, job

shadowing, and internships to show children and young adults with disabilities the wide range of potential career opportunities available to them. But to complement these activities, Tech-Link has turned increasingly to Robotics Camps, where kids program robots to compete with each other on obstacle courses. Funded by the Mitsubishi Electric American Foundation, the Howard Heinz Endowment, Highmark, and the University of Pittsburgh Medical Center (UPMC), the dynamic camps offer students the chance to participate in the same “trial and error” process that tech workers perform in the workplace.

“Showing students how technology professionals do their jobs is one thing,” remarks Brubaker, “but allowing them to work in a fun atmosphere with hands-on participation is much more enlightening.”

Rediscovering Math and Science

In November of last year, the organization invited a group of 28 middle school students from 15 schools across southwestern Pennsylvania to attend the day-long camp at the Human Engineering Research Laboratories (HERL),



courses. Children with disabilities are automatically stigmatized and treated as if they're not smart enough to do the work – but it couldn't be further from the truth. This type of activity could spur them to confidently pursue whatever subjects meet their interests."

This year's Robotics Camp was also different for another reason. Of the 28 students in attendance, half had disabilities and half did not. "The mixed aspect adds exponentially to the experience," points out Dr. Rory Cooper, Director of HERL and Professor and Chair, Department of Rehabilitation Science and Technology. "We've had mixed groups with our teenage students in the past and we decided to keep the dynamic with our younger groups as well. Interaction among children with and without disabilities at a young age goes a long way to break down barriers."

Navigating the Course

The Robotics Camp consisted of five teams, each with five students, a LEGO® Mindstorm™ robot, and an obstacle course loosely based on a map of Pittsburgh attractions. Based on an idea put forth by Tech-Link board member Jim Osborn, Executive Director of the Medical Robotics and

Technology Center of the Robotics Institute at Carnegie Mellon University, each team was named after a famous robot, some of which had a connection to the area.

After programming the robot using PC software, each team competed to perform a series of tasks such as crossing the Roberto Clemente Bridge or switching on a light in a pint-sized version of the Cathedral of Learning. The goal: To complete as many assignments in a two-minute period as possible.

But, competition aside, LEGO's Mindstorm robots were the key to making the camp a hit. They were first introduced to the marketplace in 1998 to allow children to write computer software to program different behaviors into their building block creations. The \$200 kits come with 700 LEGOs and a microcomputer that was developed in conjunction with MIT.

Light and touch sensors allow the robots to perform surprisingly complicated functions. The robots run the obstacle course by following a path marked between each attraction. According to the commands that have been programmed, the robots can complete each task to perfection or veer off course with reckless abandon.

With the help of peer mentors who are Department of Rehabilitation Science and



Technology master's and doctoral students, each team connected its robot to PC ports and programmed it to perform the required tasks. Team members estimated the direction in which their robot would travel and then tested their hypotheses. In this manner, the obstacle course tested each team's skill at programming as well as their ability to work together.

But the learning experience of the Robotics Camps goes far beyond the mere programming of robots. It is meant to open children's eyes to the world around them. Children without disabilities realize that their teammates aren't any different than they are.

"One of our primary goals," says Brubaker, "is to show children with disabilities that they are capable of doing anything. And looking at these students' faces, I'd say we came one step closer to that goal."

For more information on Tech-Link, contact Sondra Brubaker at sab992@pitt.edu or visit their website, www.tech-link.org



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located in the Highland Park VA Hospital Complex. The camp was the first to be offered to such young students; normally the Robotics Camps are reserved for older students with a greater knowledge base and more experience working with complex machines.

“We chose younger kids this year because we believe they're being left behind,” explains Bill Ammer, a technical coordinator at HERL. “In Pennsylvania, kids aren't required to take science after ninth grade. As a result, the children with disabilities are often steered out of technology

