

Centennial students, with help from Drexel, prep for robotics expo

James Boyle, correspondent | Posted: Monday, February 1, 2016 6:00 am

In a classroom at McDonald Elementary School in Warminster, four fourth-grade students wait patiently but excitedly to get their hands on one of four small, white boxes.

Inside each box is a piece of technology, a palm-sized robot that has helped the children in the gifted learning program in the Centennial School District, and their teachers, take a big step in 21st century learning.

"We don't know everything about these robots," said Michael Scancelli, who runs the gifted program at Willow Dale Elementary in Warminster. "There are times when the students will have a question that we can't answer right away. We talk with them about what solutions they have already tried, and they find the answers themselves. It's all student-led."

Scancelli brought the LocoRobo machines to the school district last summer as part of a pilot program. A parent of a former student introduced him to Dr. Pramod Abichandani, a professor and head of robotics at Drexel University. He started using the machines as part of an enrichment summer camp for fourth- and fifth-graders, then added them to the fourth- and fifth-grade gifted curriculum for all three Centennial elementary schools, including McDonald and Upper Southampton's Davis Elementary.

The district has a total of seven robots, purchasing three at \$350 per machine with the other four donated by Dr. Abichandani. The school district also authorized the purchase of five tablet computers, which host the software to program and control the robots. As part of the cooperation with Dr. Abichandani, the participating students and their teachers will travel to the Pennsylvania Educational Technology Expo and Conference in Hershey during the last week in February.

"They are going to demonstrate how the robots work and help Dr. Abichandani find more districts interested in purchasing the program," said Scancelli.

On Wednesday, the four students in Cheryl Tonkinson-Berger's class will use the robots to complete the Alphabet Challenge using the touch-screen interface. To do so, they have to program a series of



McDonald Elementary School fourth-grader Gregory Moore (right) controls his LocoRobo educational robot with an iPad as teacher Cheryl Tonkinson-Berger supervises during class Wednesday, Jan. 27, 2016. Students there are learning how to program robots in preparation for the Pennsylvania Educational Technology Expo and Conference in Hershey this February.

motions into the robot, which will spell out letters and eventually words. Points are awarded if they or other students can guess the words.

Each grabs a robot and iPad and finds a corner of the room to get to work. In one corner, Gregory Moore is testing whether his robot will follow a path that looks like the letter G, but at one point the robot spins then continues in the wrong direction. After a quick review, Gregory finds a simple reason why the machine acted so strangely.

"I wanted it to turn for 0.4 seconds, but I didn't use the decimal point," said Gregory. "It turned for too long; I just have to go back into the program and fix it."

All four students go through similar trial-and-error processes to work out their solutions. According to Scancella, the LocoRobos are first-generation machines that use two motors, one on each tread, connected via Bluetooth. The connection between the sender and receiver can be somewhat tenuous at times, meaning one side might turn faster than the other. The off-kilter movements can create unexpected curving, characteristics that the kids have learned to accept and work around.

"It's not just the scientific aspects that benefit the students," said Tonkinson-Berger. "They are also learning to problem-solve and persevere through setbacks. It can be easy to get frustrated, but they can't take out the frustrations on the robots. They're too expensive."

Another educational advantage pops up when the students work together on the program. Tonkinson-Berger's smaller class allows for a one-on-one ratio with the robots, but the 11 fourth-graders in Scancella's class and the 12 in Keely Mahan's class at Davis have to share the robots. Each school has a four-week session with the machines, part of the district's science, technology, engineering and mathematics (STEM) curriculum.

"There's a lot of teamwork among the students," said Mahan. "They might want a robot for themselves at first, but once they get started they want to work together and bounce ideas off one another."