What happens when robots go to school

by Laura Edwards

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ACT schools are breaking new ground by using pint-sized robots to spark students' interest in maths and science.

Two walking, talking 60-centimetre humanoid robots, made by French firm Aldebaran, were acquired by a team of University of Canberra researchers last year to study human interaction and encourage interactive learning.

The robots, which connect to Wi-Fi, have an onboard multimedia system including four microphones for speech recognition and sound localisation, two speakers for conversion of text to speech, a sonar range finder for finding and avoiding objects and two HD cameras for face detection and recognition.

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Leading the team of researchers is associate professor in information technology and engineering Roland Goecke, who says the robots are currently visiting ten schools in the Canberra region through a new program run by the university, with students ranging from year 2 to year 11.

“The robots basically reiterate what's happening in the curriculum already when schools sign up to the program; for younger students that could be understanding the measurements of distances or directions through various activities,” Roland says.

“As an example we will use masking tape and a ruler to set up a short course on the classroom floor, where students take turns to work out the sequence of steps, distances and turns that the robots have to follow on the course. I then enter all the students' instructions on my laptop to program the information on to an interface, which directs the robots on where to go and how far, when to turn and when to stop. The children then watch the robots walk the course to see whether their measurements have been accurate.”

Roland believes the robots could lead to a greater interest in maths, science and technology.
“So far it’s been a very engaging piece of technology and, because the robots are smaller, everyone finds them cute and non-threatening, particularly for kids in primary schools – I haven’t met a student who hasn’t loved them,” he says.

“It makes students more eager to learn and they remember it for a long time.”

The battery-operated robots can also recognise faces and objects, have conversations in French and English, play hide-and-seek, dance, and perform tai chi.

On falling, they say “ouch”, but shut down as they drop so nothing on their $15,000 kit breaks.

Roland says his team are particularly interested in using the robots to teach social skills to children with autism spectrum disorders in the future.

“Previous research has found that these children find it easier to interact with a robot than a human teacher,” he says.

“For example, aligning their attention with the people and objects around them is an important social skill. The robots would complement the human teacher, not replace them.”

Roland believes the robots could also be useful companions in retirement homes, in particular, for people with dementia.

“It’s something that has been explored, the idea of the robots being companions which can be programmed to do everything from getting your shoes from the cupboard to writing emails for people; in Australia, this research is still developing,” he says.