



# Telepresence Robots:

They're Not Just for the Jetsons Anymore

By Geoff Craven and Cody Heitschmidt

**R**obots play a major role in our quality of life. From manufacturing to intricate surgical procedures, the use of these devices is becoming more and more commonplace. The concept of using some sort of electronic device for remote communications, such as a laptop, is not a new one. Schools and agencies have been using video conferencing tools for a variety of uses, as well as applications like Skype, for some time. But using a robot as a remote communication tool is a relatively novel experience, one that is making its way into more and more classrooms, paving the way for an even better learning experience for homebound or hospitalized students.

So why use a remote robot and what makes this technology different? In a classroom using a video conferencing unit, or Skype, Zoom, Facetime or any of the multiple applications that are available, the student communicates through a stationary device. If the student cannot see the chalkboard or wants to turn and ask a friend a question, he or she must ask somebody on the remote end to physically turn the device/camera.

But telepresence robots change the game. By putting such technology into the "hands" of a homebound or hospitalized student, suddenly, participating in class takes on a whole new dimension. Now, the student is not only more engaged, but he or she becomes more "mobile" and a more active participant in the classroom. Students using these devices can roll up closer to the chalkboard if needed, turn to their friends to make a comment, and yes, even raise a hand to ask a question, instead of shouting and disrupting the class—all from the comfort of their home or hospital room.

## Robots in the Classroom

How did this technology evolve from a "toy" to a valuable communication device? Over the years there have been several generations of robots. Designed primarily for remote monitoring, telecommuting

and telemedicine, the use of this technology was very exclusive and cost-prohibitive, especially for K–12 education. As with any technology, design improvements and the lower cost of materials (robots that once cost \$9,000 a few years ago can now be purchased for less than \$3,000) have enabled these robots to become more ubiquitous. With Wi-Fi being so prevalent, these devices can be used almost anywhere.

The idea to use these simple robots as communication devices in the classroom was a collaborative effort between ESSDACK and Central Susquehanna Intermediate Unit (CSIU), two educational service agencies located in Kansas

and Pennsylvania, respectively. Several years ago, ESSDACK piloted the use of a telepresence robot for a student who was recovering from a farming accident so that he could visit his classmates and family.

Building upon the success of ESSDACK's pilot, CSIU decided to take it one step further and create its own pilot for homebound/hospitalized students so that they could regularly participate in class to enhance the instruction they were receiving from instructors who visited them at their home or in the hospital.

As with any new initiative, there were a lot of unknowns. Would staff and students be receptive to a telepresence robot in the classroom? Would the student be able

to participate and see the whiteboard and communicate with the teacher and classmates effectively? Would there be adequate wireless network coverage and bandwidth to ensure quality video communications? We were pleasantly surprised that all these concerns never really materialized. Our pilot became successful beyond our wildest dreams.

Although there are many different types and models available to choose from, the particular robot that was used in our pilot was from Double Robotics. The company's technology is based upon a Segway-type base and uses an iPad as the main controller, camera, etc., on the unit. Students can drive the robot remotely using the Chrome Web browser or by downloading the free Double Robotics IOS app.

Maddie Rarig, our first student or "robot pioneer," as we like to call her, was able to attend classes via the robot and interact with her friends whom she had not seen in almost a year. When interviewed by a local television station and asked what was the best part of using a robot to attend school, Maddie replied, "I can be with my friends!"

Likewise, when the same reporter asked her friend Blake Hardin how she felt about the robot, Blake responded: "She's my best friend, and when I found out she was going to be out of school for a while I was sad. But I can see her now, (pointing to her friend on the screen). ... I can't wait to see her when she comes back to school."

By attending class regularly via a telepresence robot, Maddie was able to return to school two weeks earlier than doctors had originally predicted. When a local health system heard about her progress, they realized the value and impact a telepresence robot can have on children who are hospitalized or who cannot attend school due to serious illness. This organization will be conducting its own medical research this fall, and scientists will be measuring outcomes such as pain management, social interaction, length of hospital stay, and of course, the child's classroom achievement.

As we travel the United States pre-

senting on our experience, every single educator and administrator whom I have spoken to knows of at least one student who could benefit from this technology. And every single robot that has been deployed has had a positive impact on everyone involved—students and teachers alike.

Whether it's a student attending music class for the first time in two years with his or her classmates, or being able to go to the lunchroom and hang out with friends, or being an active participant in the classroom, it's emotional, exciting and rewarding to see a student's smile when he or she is no longer confined to their home or hospital room. So many times we see technology being used for technology's sake, but to see how this technology is making a profound difference in a child's life is truly a life-changing experience. Seeing that child's eyes light up, the smile when they first see their classmates remotely, or a parent thanking you for providing this technology and the difference it is making in their child's life—it becomes very emotional and rewarding.

### Coming to a Venue Near You

And this is just the beginning. Museums now have telepresence robots that students can remotely navigate in order to conduct their own virtual tours. Elementary school principals who must divide their time between multiple buildings can still have a physical presence, traversing the hallways, talking with students. And even subject matter experts can now present to students remotely from anywhere, turning and addressing a specific student directly. The uses are limitless!

You may be thinking that this technology sounds too good to be true, that it won't work in your school, classroom, etc. As long as you have Wi-Fi and battery life, a telepresence robot can be used anywhere. Students, being the adaptable beings that they are, readily accept this technology and are excited to see their friends, especially if they have been out of school for a long time.

### Useful Tips

For those who are interested in deploying a telepresence robot, we recommend that you first meet with all the relevant

parties—parents, principal and classroom teacher. Obviously, there are technical issues that must be addressed, such as adequate Wi-Fi coverage and bandwidth; but more importantly, it's paramount to ensure that all parties feel comfortable with this technology. If possible, allow teachers, parents and the child to test-drive the robot in this meeting to introduce this technology to all parties.

The next step is to introduce the robot to the faculty and other students in a relaxed environment before it is placed in a classroom. This can be done by having the student visit their classmates during lunch, or during a specific class period as part of a social visit.

For classroom teachers, we recommend placing the robot at the front of the classroom, which makes it easier for the student to see the chalkboard remotely. Hallways and class periods are logistics that will need to be worked out depending on your particular location. Some schools allow the student to "drive" between classes with a buddy to help navigate doors, while other schools arrange for someone to carry the robot between classes.

If you have not used or seen one of these robots in action, you will soon. Their use will only continue to grow, especially for students who are homebound or hospitalized. Yes, while *The Jetsons* TV show may have introduced the concept of robots, they are now a daily part of our lives and are making a difference every day in a child's life. And isn't that what the future is truly about? **Tech**

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### EXPLORE MORE

To see television coverage of the pilot robot with Maddie and Blake, visit [www.youtube.com/watch?v=9n87BkZP5Wg&feature=youtu.be](http://www.youtube.com/watch?v=9n87BkZP5Wg&feature=youtu.be)



Photo courtesy of CSIU

◀ Geoff Craven, instructional technology manager at CSIU, communicates with a student via the Double Robotics telepresence robot.

## Deploying a Telepresence Robot in Your School

Here are some helpful tips for anyone wanting to deploy a telepresence robot.

**1.** Meet with all the relevant parties to gauge interest and comfort level with this technology. That includes parents, the principal, the student and the classroom teacher. Allow teachers, parents and the child to test-drive the robot in this meeting by way of introduction.

**2.** Introduce the robot to the faculty and other students in a relaxed environment before it is placed in a classroom. We suggest having the student visit his or her classmates during lunch or during a specific class period as part of a social visit.

**3.** Classroom teachers, place the robot at the front of the classroom, which makes it easier for the student to see the chalkboard remotely. Don't forget to figure out the logistics of navigating hallways and getting the robot from class to class.