

STEM's newest darling: Robotics

It's the 21st century's newest must-study subject. So how can schools get more students exposed?

BY MICHAEL FITZGERALD | OCTOBER 02, 2014

IT'S LATE AUGUST, and workers inside the Eliot K-8 Innovation School's Upper School building on Commercial Street in Boston's North End are still unpacking on the second floor, attaching legs to the tables students will use in the new robotics classroom. Boxes and furniture are scattered in the hallway.

But Traci Walker Griffith, principal of the Eliot School, doesn't see the clutter. She sees a new opportunity to teach all-important STEM subjects — science, technology, engineering, and math. Starting in just a few days, students will get to work on those robotics tables. And she is convinced that this year's kindergartners will have mastered a host of 21st-century skills as well as problem solving, teamwork, and persistence by eighth grade. But then, "I live in utopia," says Walker Griffith, whose blue eyes blaze with the energy that has helped transform the Eliot School from the lowest-ranked elementary school in the state to one that, despite expanding, still has to turn away families eager to land a spot there.

[Edited]

In the Boston area, the push may be related to the field's role in the local economy. IRobot, which makes military and consumer robots, and industry-focused startup Rethink Robotics are here, and so are Kiva Systems, which automates warehouses and is owned by Amazon.com, and Boston Dynamics, the Google-owned maker of the robot cheetah and various machines designed to simulate human functions. Kids who get robotics should be able to walk into good jobs, goes the thinking, and companies, seeing the value of a pipeline of educated workers, are sending scientists and engineers into classrooms as volunteers.

One such program, Science From Scientists, was founded by Erika Ebbel Angle in 2002 (back then she was Erika Ebbel; she married iRobot cofounder and CEO Colin Angle in 2010). The program, she says, has helped increase science scores on the standardized MCAS tests by 20 percent overall in schools that use it, and by 34 percent in schools that fell below state averages before the program came in. Colin Angle, who says he struggled in remedial math until a fifth-grade teacher helped him tap his potential, says programs introducing real-life work in classrooms can "materially change aptitudes and attitudes toward science." His company also has a program called iRobot STEM, where all employees are granted two paid days to go into schools, take robots, and educate students about real-life opportunities in the field. About 50 percent of them did this last year; the company is hoping for 60 percent this year. "We have a massive challenge graduating enough kids with interest in STEM education and STEM careers," says iRobot's Angle. "Solving this problem is huge."

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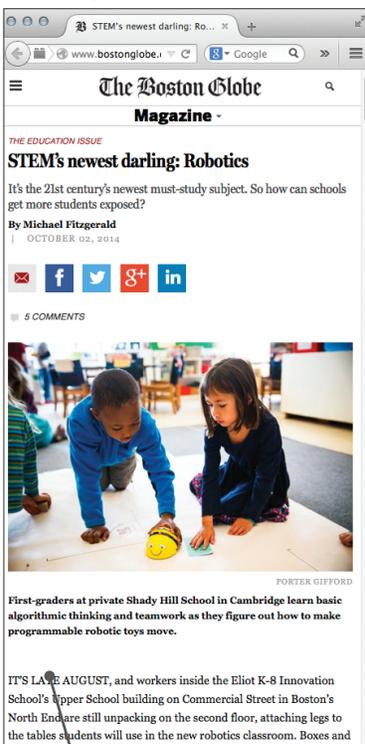


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PRIMARY AND SECONDARY SCHOOLS across the United States, and certainly in the Boston area, are looking at packed school days and limited budgets and deciding it's worth the investment to add course work in robotics. Over the past 18 years, the Tufts Center for Engineering Education and Outreach has instructed thousands of teachers in how to teach robotics to kids. And today thousands of high schools and, increasingly, junior highs and middle schools send teams to compete in FIRST Robotics and VEX Robotics events — a 21st-century version of debate club, basically an extracurricular academic sport.

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● Screenshot of the actual news article at <http://www.bostonglobe.com/magazine/2014/10/02/stem-newest-darling-robotics/FrQEOiLNbWXL5GIUE8WP/story.html>

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Faith in the power of robotics to inspire students — from the basics of algorithmic thinking to the engineering behind building machines that do really cool stuff — is part of the Boston area’s postsecondary academic culture, too. That’s one of the ideas behind Lifelong Kindergarten, the research group run by Mitchel Resnick within MIT’s Media Lab.

Researchers at the lab in the 1980s and ’90s, funded by Lego and other sources, including the National Science Foundation, created the system of programmable bricks that inspired such products as Lego Mindstorms. A professor for 22 years, Resnick says that humans learn better when they’re making things and that hands-on work teaches skills like project design, collaborating, and executing ideas. He thinks schools stop this process too quickly after kindergarten. “The education system tends to shift, and you spend a lot more time filling out work sheets at your desk or listening to a lecture,” he says. Resnick thinks robotics can help make learning more fun and science less daunting.

Parents from the community — including one Eliot parent, Israel Ruiz, who also happens to be the executive vice president of MIT and an engineer by training — are also big believers in the vision. “Tangible techie things for kids are useful,” he says. “They experiment, they manipulate things, they interact together.”

Plus, robots are cool. “People just love robots,” says Laurie Leshin, the president of Worcester Polytechnic Institute and geochemist who is a member of the Mars Rover team, one of the most high-profile real-life robotics projects yet. Leshin says robotics has the potential to galvanize science learning. “Second- and third-graders get this stuff inherently,” she says. “By the time they get to middle and high school, life has beaten out of them some of that interest, and I think robots are a way to get that back.” The university runs teacher training programs in conjunction with its summer camps for area kids, bringing teachers in to learn alongside the students — a program Leshin says the school would like to expand.



SUZANNE KREITER/GLOBE STAFF

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