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Robotics: 23 years of STEM inspiration

Robotics: 23 Years of STEM Inspiration

by Denise Johns and Tim Butterworth

PITTSFIELD — Assisting local manufacturers with adopting the latest technologies is core to our mission at the Berkshire Innovation Center.

Since first opening our doors three years ago, we have worked hard to establish ourselves as regional experts in robotics and automation. The seeds of our mission go back even further. Over two decades prior, we can highlight an early effort to invest in the future of STEM (Science, Technology, Engineering, and Math) for Berkshire County youth.

In 1999, BIC Board Member Doug Crane discovered a new robotics challenge being held in Boston. Based on Lego Mindstorms kits, these robots were designed and constructed from familiar plastic pieces. Yet unlike your childhood Lego set, these robots were granted autonomy through a suite of sensors, motors, and a "brain" to control them. The challenge was geared towards middle school students: for most, this would be their first experience with robotics. Lego made the challenge easily approachable, and Crane was inspired by the potential of these toys to encourage interest in STEM pathways. As a father of three, Crane knew he had to bring this challenge back home to Berkshire County.

"I was struck by the incredible energy and enthusiasm at the competition. It felt like a sports tournament," he said. "The kids were simply jazzed, passionate and focused. It was immediately clear to me that I wanted my kids to be able to have an opportunity to experience this."
Crane held an initial meeting with the goal of fielding a single team of up to a dozen students to compete in Boston. He was stunned when 200 students and their families came to voice their interest. The mandate was clear: Berkshire County needed its own competition, and so the Berkshire Robotics Challenge was born. The first BRC Challenge was held in February 2000, and since then it has involved 4,062 students, 1,064 coaches, 426 team sponsors and 657 volunteers with a pre-pandemic peak of 32 teams participating.

Modeled after the U.S. First Lego League, the BRC is inclusive of students from third through eighth grades (ages 8-14). Students work in teams toward a competitive goal while learning problem-solving, teamwork and good sportsmanship. With the aim of building their engineering and programming skills, each team must design and build a robot that completes a variety of missions in under two and a half minutes. Teams typically spend between 8-to-10 weeks developing their robot to earn points by completing as many of these missions as possible.

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The competition also encourages broader interest in science fields through a complementary research project based on that year's theme. Past challenge themes have been designed around topics such as assistive technology, community and urban planning, education and learning, global climate change, health and well-being, oceanography, nanotechnology, recycling and renewable energy, space exploration, and transportation. Each year, a new challenge is issued that is designed to emulate a current scientific, engineering, or technological challenge.

For this year's challenge, titled "Super Powered" which takes place March 18, teams will have to design their robots to generate, collect, transport, store, and distribute "energy units" across 16 unique missions. Eric Planey, CEO of SolaBlock, will give the keynote address to discuss the critical need for renewable energy and how their building materials with embedded solar panels will help address that need. SolaBlock is one of several BIC member companies committed to developing clean technology here in the Berkshires.

While the BRC has always received an enthusiastic reception across the county, credit for its sustained success goes to the ongoing efforts of a cohort of committed volunteers. Crane originally pulled together a dynamic planning committee, consisting of John Wood, Bernie Klem, Lee Flournoy, Denise Jezak, Dorothy Curtiss, and Denise Johns. Johns, the BIC's business administrator, has continued to organize the event ever since.

"When I first got involved, I had no idea what the BRC would grow into," she said.. "Now, 23 years later, my own daughter is participating for the first time. She's fortunate that we live in a region with so many folks working to introduce students to technology."

Johns is joined on the current BRC committee by Kevin Mooney of General Electric, Wil Bourdon and Jim Chalfonte of General Dynamics Mission Systems, and Kate Light and Tim Butterworth, assistant director and operations manager of the BIC, respectively. Many employees of General Dynamics volunteer on the challenge day as team coaches. In addition to the tremendous contributions from volunteers, making this challenge widely accessible has required significant fiscal support. With confidence in the educational mission of the BRC, the Feigenbaum Foundation has been a longtime supporter of the challenge.

How important is it that Berkshire youth gain this early exposure to robotics? We know that career development is one clear benefit: STEM careers are academically demanding, and fostering an early interest in these fields can give students an advantage in their own career growth. This technical focus does not mean that only the left brain is engaged. In fact, the challenge is a tremendous way to spur creativity through inventing novel solutions to each challenge.

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The skillset of strategic problem solving is difficult to learn in the abstract. The BRC succeeds by providing structured challenges to ease students into an effective approach to problem solving.

Equity and inclusion are major goals of both the BRC and the BIC. Studies have shown that students on the autism spectrum can be better engaged learners when robots are part of their education. We also believe that the challenge permits girls to explore their interest in STEM at an early age, before societal pressures discourage such exploration. The fun atmosphere and low stakes of the competition encourage even the shyest students to freely contribute ideas. For many, the BRC is an opportunity to engage with robotics, programming, design skills and more that they otherwise would not receive in school for years, if ever. Along with the "varsity tech" programs that we offer, the BIC is committed to lowering the barrier to entry for technology for all students in the Berkshires.

"The BRC was my earliest experience with robotics and programming," Butterworth said. "I begged my parents to buy me a kit of my own for Christmas and was fortunate that they also saw the educational value. The hundreds of iterations of Lego robots that I built were my first steps towards a career in engineering."

We at the BIC believe that early exposure to technology is critical to developing a robust workforce pipeline. This pipeline will lead to better jobs for our children and a healthier, sustainable economy for us all. We often hear that robots are the future. On March 18, over 100 Berkshire students from 14 teams will prove that wrong. Thanks to people like Doug Crane, robots are the present. To learn more about the BRC and support youth technology engagement in the Berkshires, visit www.berkshireinnovationcenter.com.