Case Study

Three Companies Aid Engineering Education

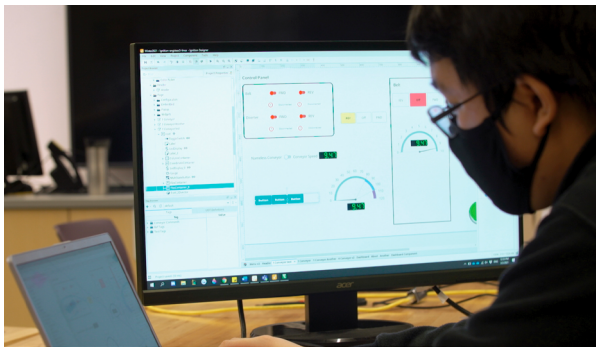
Brock Solutions, Opto 22, Inductive Automation Donate Services, Hardware, Software

In many ways, today's engineering students are our future. They'll be key players in keeping our industries running for the next few decades. That's why companies and schools are working together to improve the educational experience for young engineers. Inductive Automation's University Engagement Program is a good example. It creates partnerships between industrial professionals and colleges, universities, and trade schools. It also provides the Ignition industrial application platform for students. The goal is to build bridges between industry and education in local, national, and global communities — promoting creativity and innovation along the way. The program helps to improve student skills, assist educational institutions, and enhance the talent pool for employers.

The Inductive Automation University Engagement Program recently helped with a unique automation project at the University of Waterloo in Ontario, Canada. The university has 40,000 students, with 8,000 in engineering. The new project combines real-world problems with professional equipment and expertise from top-notch companies, giving students practical hands-on experience that will help prepare them for employment after graduation. It's happening in the university's Immersive Design Engineering Activities (IDEAs) Clinic. The IDEAs Clinic includes a lab that can accommodate 200 students. It's a place for students to learn by doing, working closely with their peers and teachers.

Many Participants

The Brock Solutions Industrial Automation Hub in the IDEAs Clinic is a small-scale automation project that was put together by students and faculty, with help from Brock Solutions, Inductive Automation, and Opto 22. The project focuses



Students and teachers create automation projects in the IDEAs Clinic at the University of Waterloo.

on moving small packages via conveyors and a robotic arm. The system includes PLCs, belts, pulleys, bearings, gearboxes, motors, wiring, a camera, a diverter, and software. It's allowing students to learn automation, motion control, data management, safety, factory planning, communication, coding, and more. The project involves state-of-the-art technologies such as computer vision, edge-to-cloud computing, MQTT, and the Industrial Internet of Things (IIoT). And the system is designed for future expansion.

Brock Solutions helped with the system integration, and Opto 22 donated groov RIO and groov EPIC controllers. Ignition, the supervisory control and data acquisition (SCADA) software to run the project, was donated by Inductive Automation. Ignition is an industrial application platform with tools for building solutions in SCADA, IIoT, human-machine interface (HMI), and manufacturing execution systems (MES).

The three companies also donated time and expertise to the project. As of March 2021, more than 400 students have participated in the activity — and they're learning a lot. "This project

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– Davin McDougall
Business Unit Leader, Brock Solutions

gives the students a unique opportunity to be exposed to all levels of industrial automation, something they don't get in any other course," said Eugene Li, an instructor at the University of Waterloo.

Brock gave the students a problem to solve with the conveyor project, and the students have responded. "One of the great things about this problem is that it's so multi-disciplinary," said Chris Rennick, engineering educational developer at the IDEAs Clinic. "We've had students from a number of different engineering programs develop this, and it's going to require students to integrate knowledge from across their courses to create solutions."

Students See Benefits

It's not just the professional software, controllers, and other equipment that provide a positive learning experience. "Students get exposure to the technology, the terminology, and the real-world constraints that we see in automation systems," said Davin McDougall, business unit leader at Brock Solutions.

The students appreciate the help. "I think it's really cool, what these companies are doing for us," said Kevin Le, a second-year student in computer engineering who is also employed at the IDEAs Clinic. "It provides a glimpse into what happens in industry. And this project allows us to explore potential career paths without having to make a huge commitment to something we may end up not liking. But at least we've been able to try it."

Many students have seen their skill levels and confidence grow. "This project has provided me some amazing challenges that I've learned so much from. It's been really exciting," said Rapti Ghosh, a third-year mechanical engineering student who is also employed at the IDEAs Clinic. "The IDEAs Clinic has really given me some independence, and has allowed me to take initiative, and take the project where I want it to go. I've really been able to take a lead on my learning this term."

Teachers and Employers Too

Instructors are able to teach more effectively when the students are handling real-world tools. It helps students understand some engineering concepts better. The arrangement has been working so well, the university plans to expand things beyond the conveyor project. "One of the really great things about Ignition and the Opto 22 PLCs is that they're so flexible," said Rennick. "So as we move forward, we're looking to expand out of package sorting, into domains like water treatment, so we can reach more students in our engineering programs."

Employers, too, get a good deal. "This project benefits potential employers by bridging the gap between a new graduate and an engineer who's ready to go into the field — saving employers time and money," said instructor Li. Brock's McDougall agrees. "Many of our employees have graduated from the University of Waterloo engineering program, and it continues to be a great source of qualified candidates," he said. Students, teachers, and potential employers involved in this project are happy with the result. "It's fantastic to see the commitment from the instructors and the students as we bring real-world problems into the classroom," said McDougall.

People who run the IDEAs Clinic also like what they've seen with this project. "I'd really like to thank Brock Solutions, Inductive Automation, and Opto 22 for making this activity possible," said Rennick. "Without their expertise and them spending time with us, we'd never be able to offer an activity like this to our students."

Watch the video online at: https://ia.io/waterloo