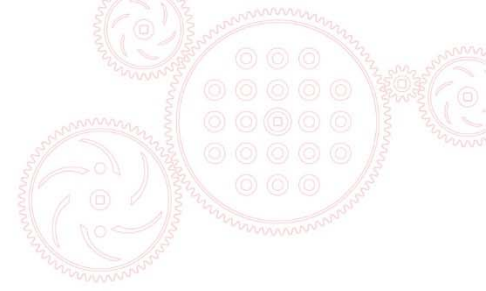


VEX Robotics Case Study

Luis Medina, Clear Creek Independent School District

League City, Texas, 2016



Thank you for taking the time to speak with us today. Could you please introduce yourself?

Luis Medina, I am the Robotics Coordinator for the Clear Creek Independent School District in League City, Texas (outside of Houston). I have been in education for 12 years, 10 of which have been focused on robotics.

Can you tell me a little about the robotics program in your district? How widespread is it, and would you consider yourselves successful?



Our program starts in 3rd grade with a project called EARLY (Engineering and Robotics Learn Young). Founded by Lucien Junkin of the NASA Johnson Space Center, students create mechanical devices using basic simple machines to solve a challenge. 4th and 5th graders then utilize the VEX IQ platform to learn some programming and continue developing their mechanical concepts. Intermediate level students graduate from the plastic VEX IQ robots up to the more robust VEX EDR system, where they can earn an elective credit in a course that utilizes the free VEX EDR curriculum. In high school we participate in the VEX Robotics Competition (VRC), the BEST robotics competition, and the FIRST Robotics Competition (FRC). We are also a Project Lead the Way (PLTW) district, utilizing VEX EDR in all associated engineering courses.

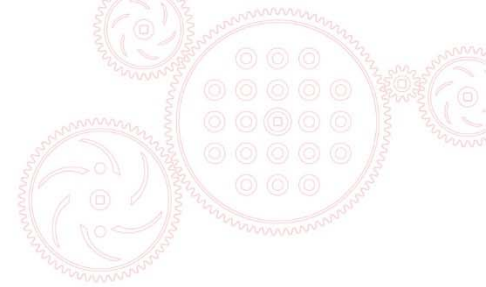
All told, we have 23 out of 26 elementary schools using VEX IQ, 7 out of 10 intermediate schools using VEX EDR (2 more coming online next year), 2 intermediate schools in BEST, and 6 out of 7 high schools using VEX EDR. We also create our own competition as part of the PLTW Principles of Engineering course, wherein 380 students (120 teams) across the district compete using a modified version of that year's VRC game.

Success can be measured in a number of different ways. As far as competition is concerned, our BEST team won states in 2014 and has made it to the state competition for 5-6 years, our VRC team was a world championship finalist in 2015, and our FRC team was a world championship winner in 2015.

VEX Robotics Case Study

Luis Medina, Clear Creek Independent School District

League City, Texas, 2016



How do you compare using robotics in the classroom vs on a competition team?

While competition may not be *vital* to student success, it is *necessary* to capture student interest. With this in mind, we are aligned K-12 when it comes to classroom vs competition usage. We believe in learning the engineering theory early on and applying it to competition later. If you teach the theory without a venue for students to test it out in a competitive way, then they tend to lose interest. I believe we are successful in high-level competition because we have nurtured that growth pattern from early on.

In your experience, how does robotics compare to other STEM education methods?

Engineering and problem-solving completely change the game. In robotics, there are a thousand ways to solve each challenge, allowing the students to apply the theory that they've learned into creating a mechanical device. It's an extra level of complexity beyond the whiteboard.



It's also important to remember that we live in an environment where students are very accustomed to instant gratification; they know how things operate in a virtual world. Being able to have a real-world competition with a device that they've built from the ground up engages students and can really solidify a passion for engineering.

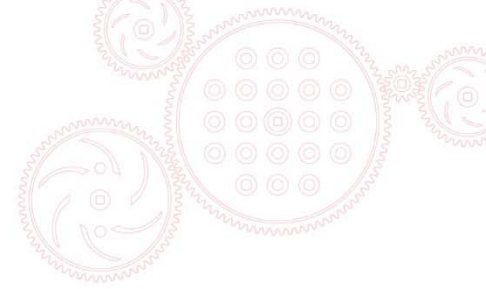
How has the VEX EDR platform helped to shape your robotics program?

As a former classroom teacher, the biggest thing that I was looking for in a robotics platform was ease of use. It had to be something that could be brought in with minimal disturbance to the classroom and be used by any teacher. There's no room for expensive tools, fancy shops, etc. The VEX platform really lends itself to that mindset - put a couple of desks together and you have enough workspace to build a robot. As far as tools go, VEX pretty much provides you all of the tools you need. That was crucial to me, and has been one of the biggest reasons why VEX has been so successful and widespread in my district.

VEX Robotics Case Study

Luis Medina, Clear Creek Independent School District

League City, Texas, 2016



How have you personally witnessed a VEX program have an impact on a student?

Not even a year ago, we had a student who was in trouble with the law, had dropped out of school, and was all but kicked out of his house. He came to our alternative high school and ended up into their robotics course. After his first competition, he actually came to my office asking for additional lessons on torque and complex gear ratios – his robot was not performing the way he thought it should have, and he wanted to learn how to improve it. We have a “no pass no play” policy, and this student (who was very close to going nowhere) is now maintaining all A’s and B’s just so he can stay in the robotics program. It truly is a driving force for those students, and we shape our programs around them.

What are your growth plans for younger students in your district? Why does the new VEX IQ platform appeal to you?



For me, the ability to have the students utilize both a handheld controller and computer programming is huge. We’ve used other platforms in the past where programming was a nightmare due to inherent inconsistencies due to battery life, motor strength, etc. It was very frustrating for students to experience, and for teachers to try teaching programming concepts when they’re not getting the same results every time. When the VEX IQ platform solved that problem, while also giving the students the opportunity to use a joystick to drive it themselves, it was a no-brainer for us.

What advice would you give to a new school or teacher looking to get started with robots in the classroom?

In my opinion, VEX really nailed robotics education. Most platforms have a product and expect everybody else to meet the needs that that product has. VEX looked at what would benefit the teachers, the students, and the district, then developed a product to meet those needs. There are free resources, a ton of teams already established that are willing to help out, it’s cost effective for a school or a classroom, and it does not require a lot of mechanical resources to be successful. A teacher with minimal mechanical inclination can be just as successful in a VEX program as somebody with 10 years of engineering experience. My advice would be to go with a platform that is teacher-friendly, that is easy to use in a classroom, and resource light - that’s VEX!