

Building Dreams

Renowned STEM educator **Fredi Lajvardi** shared his students' amazing story

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When Fredi Lajvardi began his career as a science teacher at Carl Hayden High School, an inner-city school in Phoenix, he was quickly frustrated by the lack of interest among his students. So, he started an after-school club to try and engage students in hands-on projects.

One day, Lajvardi took his students to an electric car competition. Students saw the cars and wanted to build one. Lajvardi was skeptical given that the competition wasn't open to high school teams and that they knew nothing about building an electric car. He told his students that they could compete if they got a rule book and an okay from the competition director. One of Lajvardi's students disappeared for about 10 minutes and came back with a copy of the rule book and a signed note from the director that they could compete the following year. Lajvardi was a little overwhelmed, so he asked for help.

"I got experts in the field to come in and talk to the students," Lajvardi said. "I saw my role as a teacher change to be not so much a provider of content, but someone who could get kids the information they needed."

The club moved on from electric cars to robotics and really hit its stride, engaging even more students, including girls. Lajvardi also saw students get interested in science and engineering careers.

"All of a sudden, they're taking the classes that they normally run away from," Lajvardi says.

In 2004, a small team of Lajvardi's students signed up for a new competition — the Marine Advanced Technology Education ROV Competition. Lajvardi and his students decided, since it was their first year, that they would learn more if they competed in the college division, which included teams from MIT and other prestigious engineering schools.

The students patched together a robot with spare parts that didn't look great, but proved to be innovative. After the first day of the competition, the underwater event, the team was surprised to be in third place.

However, Lajvardi didn't have high hopes for his team in the last two rounds of the competition — the presentation and technical writing. He remembers sitting in the waiting area outside the hall where teams were presenting their robots

and answering questions from the panel of judges. While this portion of the competition took most teams about 40 minutes, his team was out in only 20 minutes.

"Right away I thought, 'What happened?'" Lajvardi said. But his students reassured him that it had gone well. The judges were impressed with their grasp of the metric system and the simplicity and clarity of their presentation.

At the awards ceremony, the third-place team was announced and it wasn't Lajvardi's team. He remembers thinking that they probably got fourth or fifth place, but then he started adding their points together and realized they had done much better. When they were announced as the first-place team, beating MIT, Lajvardi couldn't believe it.

The story of Lajvardi and his team of students was told in the book "Spare Parts," which became a movie in 2015 starring George Lopez. The tagline from that movie is "If life doesn't give you a dream, build one."

"I tell my students that you're the only one who can decide whether or not you're going to succeed," he said. ■

"If life doesn't give you a dream, build one."