



Educator Case Study

FRIDAYS ARE FOR INVENTION AT OREGON CITY SERVICE LEARNING ACADEMY

At Oregon City Service Learning Academy (OCSLA), a public charter high school in the Oregon City School District located near Portland, invention has become a key part of the school's mission of service to the community. Freshman and sophomore classes use Lemelson-MIT JV InvenTeams activity guides and accompanying invention kits to design unique and useful STEM projects from the ground up.

The school helped pioneer the JV InvenTeams curriculum in Oregon during the 2014-2015 school year and pilot year of the JV InvenTeams initiative with funding from a 21st Century Community Learning Center grant. At the time, biology and horticulture teacher Bethany Taft had been charged with developing programming for the school's weekly service days, which focus on making a positive impact through community service. The Lemelson-MIT Program's JV InvenTeams leaders partnered with OCSLA and took steps to work with the school and its largely underserved population (60% qualify for free and reduced-price school lunches). Taft served as the local lead of the partnership effort, which also included her administration and other teachers.

OCSLA's four JV InvenTeams, each with about 20 students, learn how to safely use tools and explore new materials necessary for hands-on invention projects. They build skills and confidence through these carefully designed activities.

"At first, I thought JV InvenTeams would be too fancy a program for us and that we wouldn't be able to afford it. Materials costs are often the barrier to teaching invention," Taft said. However, the school qualifies for the Lemelson-MIT JV InvenTeams grant that provides free companion invention kits for each JV InvenTeam activity project. The grant program is currently available to schools in Massachusetts, Texas, California, and Oregon, along with training and staff support. Eight JV InvenTeam activity guides (educator and student versions) are posted on the Lemelson-MIT web site's resources page for educators all over the world to download.

“ To me, STEM (science, technology, engineering, and mathematics) integrated through invention serves as a point of engagement for students. They get

to work with their hands and learn critical soft skills such as persistence, grit, problem-solving, how to deal with failure, and how to work with other people. These skills are important to help break the cycle of poverty. ” – Bethany Taft

OCSLA’s approach to teaching and learning combines academic classroom curriculum with meaningful work and community service experiences. The concept behind service learning is to help integrate students into their community and instruct them in the history and culture of where they live. Students participate in and complete assignments, projects, and reflections related to community service and local work experiences as a regular part of the curriculum.

Taft finds JV InvenTeams’ minds-on and hands-on curriculum aligns well with both aspects of the school’s mission. For instance, students worked with the Electronic Textiles activity guide and accompanying kit to make a battery-powered textile and went on a field trip to the local IBEW Local 48 in Portland to learn about meaningful work in careers that include electronics. The human-centered design aspect of all JV InvenTeam guides aligns with the school’s service learning mission.



Three other teachers from math, history, and physical education are working with Taft to create

a dream team that will introduce underclassmen to invention. Taft instructs her fellow teachers how to integrate science with the disciplines they teach. A strong advocate for invention education in the classroom, Taft enjoys teaching discovery and project-based learning. “Invention gives kids a boost of confidence that comes from problem-solving individually and as a team,” she says. “I want my students to become scientifically literate human beings who are able to ask questions and think critically about things.”

Along with activity guides and kits for electronic textiles, which focuses on elements of wearable technologies, OCSLA has tackled the JV InvenTeam themes of “Growing Green” (urban hydroponics), “Noise Makers” (speakers and instruments), and “Shoe Soles” (design and pattern transfer). JV InvenTeams has improved not only her students’ outlook, but also her own.



“ JV InvenTeams has 100% changed the way I teach. I’ve become more persistent in solving problems, exploring different and more creative solutions. I’m also more willing to let the kids struggle a little, knowing it will lead to a better outcome. ” – Bethany Taft

The OCSLA staff helped expand the JV InvenTeams curriculum, too. In 2016, nine staff members traveled to the MIT campus to work in the lab with the Lemelson-MIT staff. There, the OCSLA staff helped develop and test the Noise Makers invention kit prior the kit being made available to other teachers and schools.

Taft hopes that starting invention early on with high school students will spark in them a lifelong interest in solving real world problems. While OCSLA does not have a Lemelson-MIT InvenTeam yet, upperclassmen do participate in the state of Oregon's MESA program. The Oregon MESA program, which focuses on mathematics, engineering, and science achievement, and the Lemelson-MIT Program are both made possible thanks to the support received from The Lemelson Foundation.

About Lemelson-MIT JV InvenTeams™

The Lemelson-MIT Program offers grant support to educators in Massachusetts, Texas Oregon and California to provide students in grades 6-10 with STEM enrichment opportunities using JV InvenTeams invention curriculum, pre-assembled kits, training and staff support. The JV InvenTeams initiative piloted in 2014 in Massachusetts and Texas, expanding to Oregon in 2015 and California in 2016. Over 1,375 students and 200 educators/after-school coordinators have benefited from the JV InvenTeam initiative. The JV InvenTeams invention activity guides are available on the Lemelson-MIT website for free and pre-assembled invention kits for a fee. Visit lemelson.mit.edu/jv-inventeams to learn more

