

SCIENCE: Program could create cultural change at school

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the robot's movements, and started making adjustments.

This class, held in a room that previously had been a rarely used wood shop, was now busy, thanks to grants from local businesses and organizations. This year, four businesses provided grants toward the addition of one STEM class to the school's curriculum.

Science, Technology, Engineering, and Math help students learn real-world skills like problem solving, Principal James Brown said on Friday, Oct. 18.

To that end, Exxon Mobil granted the school \$500, and Kinder Morgan gave \$4,400, both of which went toward SMART boards and short-throw

projectors for science classrooms. The Rotary Club of the Caldwell's gave \$10,000, which purchased 28 laptop computers for students and two for teachers. The Lego Mindstorm robots used in the STEM class were purchased using a \$10,000 grant from the Caldwell-West Caldwell Education Foundation.

Brown applied for the grants to benefit all students in seventh and eighth grade, but also had one group particularly in mind — women and girls.

The STEM class is a "cycle class," meaning that students take it once a year for one 10-week marking period.

"I was looking for an additional cycle class that would provide a hands-on opportunity

in the classroom to tie (the sciences) together and apply it to a real world scenario," Brown said.

In addition, said Jane Kinkle, a seventh grade science teacher, girls in particular "have never been targeted as science recipients" by the culture at large.

She said that her sister, who is now a biochemist working for the state of Alaska, was "picked on and teased" as a child for her interest in science. "Women are still suffering for things like that...but now girls are being encouraged to be engineers (and) they are excited to be able to build stuff."

The STEM class is mandatory, not an elective. That ensures that "(gender) disparity doesn't come into play here," said Jeff Bishop, an eighth grade science teacher who used some of the STEM materials in his classroom.

"It's very important for kids to understand that science and technology are important for understanding their world," Kinkle said.

Frank Antonucci, a seventh-grade science teacher, was leading a STEM class on Friday, Oct. 18. He also teaches at James Caldwell High School, and said that technology-based classes there have "traditionally had very low female enrollment."

He and Brown both theorized that this was because stereotyping begins early in elementary school. Putting students on more equal footing by bringing STEM class to the fore as a mandatory subject has helped to change that.

"Now that it's mandatory at the middle school level we see the enrollment increase in the high school," Antonucci said.

Brown previously worked as the vice principal at the James Caldwell High School, and said that "Enrollment in technology classes were low...one of the reasons, I think, was that students didn't get early exposure

(to technology). STEM is the way to go for the future, to prepare kids for 21st century jobs."

It's only been a few months since the STEM class started, but Brown and Antonucci hope to see a major culture change in the high school as a result.

"Girls in the past might say 'I'm not going to do that because I don't know what it is,'" Brown said of STEM classes. He hopes that the mandatory class in the elementary school will give girls more equal footing in high school.

Brown wants students to walk away from the STEM class with specific knowledge of subjects like robotics, but also with problem-solving skills that can apply to any subject or career across the curriculum.

He has seen successful so far. "(The students) are all engaged, all excited, and that's hard to get in a science class...There's a lot of movement in that classroom. What I'm seeing in general is kids helping kids."

Another thing he has noticed is that girls are thriving. "In my walkthroughs it is clear that in a number of lab groups, the female student is taking the leadership role. We don't assign group leaders. (The students) know when they know what they're doing."

"We want to put a female student in a leadership position in what has been a male-dominated field," Brown said. That hasn't been difficult when every student has to take the same STEM class. "They lead themselves. They don't even know they're doing it."

Alex Valenti, an eighth grader from Caldwell, said that she found the STEM class to be "really fun and different from what I learned before." She described herself as being more into life sciences, such as biology, before she took the STEM class, but having much more interest in robotics and computers now.

Julietta Thron of Caldwell is

also in eighth grade and also found that STEM expanded her area of interest in science. She said, "I love chemistry," and that she "used to get experiments with chemistry for Christmas...but I never thought that just from pressing some buttons you could program a robot and get it to do all these things."

Griffin Silverthorne, an eighth grader from Caldwell, also said that STEM was one of his "favorite classes."

Kinkle said that technology such as cell phones and classes like STEM mean that "young women are getting encouraged to get right in there, solving problems and having discussions ... it's very exciting and encouraging."

Adriana Halkias, an eighth grade physical science teacher, said that another way the school encourages diversity in the sciences is with the yearly Science Career Week, where students' family and friends who work in the sciences come into the classrooms to talk about their careers. "A lot of the people that come in are women...it shows (students) diversity and how women can be involved in scientific study."

Isabella D'Agostino is a seventh grade science teacher whose parents told her that science was "a man's field."

"Over the years I've seen a big change" in the gender disparity of students inclined toward science, she said.

That manifests both in how students perform in class and in how they perceive society as a whole.

She instructs her seventh grade students to draw a picture of a scientist at the beginning of the school year, she said. She used to get a lot of Albert Einstein look-alikes — men with frizzy hair and chemistry sets. As the school makes an effort to diversify and emphasize the sciences, though, she has seen the image change. "(The students) are beginning to realize that there's more to science than just the chemistry part of it," she said.

"And, I'm beginning to see drawings of girls."

Brown thanked the STEM grants and said that he and the Board of Education are always looking for more. "Without the grants I don't think a lot of it would have been possible," he said. "We were fortunate to have the space in the first place...we were able to start off STEM with a lot of equipment that established programs don't have."

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