



## STEM ENDORSEMENT PREPARES EDUCATORS FOR A SHIFT IN PEDAGOGY

With more emphasis being placed on STEM education nationwide, educators have seen a need for a shift in pedagogy to a more hands-on, critical thinking, problem solving approach to education.

Amanda Keller, principal at Stewart Elementary School, found that completing an 18 credit-hour series of courses, called the Elementary STEM Endorsement, through Weber State University in partnership with the STEM Action Center prepared her to lead the shift to STEM education.

“I recognized a shift to a more integrated curriculum and student-centered approach was on the horizon in elementary education, but wasn’t sure how to make it a

reality,” Keller said. “Even though I’m a new principal, who likes to take an innovative approach to education, I found that I needed more training to be able to lead my teachers into the future. When the STEM Action Center offered the endorsement program, I thought I would give it a shot, but I never expected it to change my philosophy of education so dramatically.”

The Elementary STEM Endorsement was created in partnership with institutes of higher education, district leaders, the Utah State Board of Education, and classroom teachers in Utah to develop a stronger knowledge of STEM subjects for Utah teachers in grades K-6. Universities currently participating in the program include the University of Utah, Utah Valley University, Weber State University, Brigham Young University, Utah State University, Dixie State University and Southern Utah University.

“The STEM Elementary Endorsement is really intended to help teachers of our youngest students feel comfortable with science and math and the integration of those subjects into their teaching day,” said Kellie Yates, program specialist with the Utah STEM Action Center. “For so long, we have had an adult population that has been very comfortable saying things like ‘I’m not a math person.’ That won’t work for our students anymore. When a teacher loves a subject, it spreads to their students. Getting these young students interested in STEM at an early age could be a game-changer when it comes to increasing student interest and engagement in STEM in their futures.”

Currently 333 educators statewide have completed the two-year program that started



*Claudia Janke, Jennifer Dimon, and Amy Neal, educators at Stewart Elementary, participate in the STEM Elementary Endorsement program.*

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at the beginning of the 2015-2016 school year and ended in the 2016-2017 school year. More than 426 educators statewide are enrolled in the current cohort.

Three teachers have completed the endorsement program at Stewart Elementary School and eight more are currently enrolled in the program. As they’ve worked through the endorsement, their instruction has shifted to a more hands-on approach focused on engaging students in problem solving and critical thinking.

“It was a significant and challenging shift in how I viewed teaching and learning,” Keller said. “But preparing students to be academically proficient in these concepts through creativity, critical thinking, and wonder, opposed to the traditional teacher-centered instructional model, has been exciting and successful. It hasn’t been an easy shift for all of our students, but it is obvious that they are developing a deeper conceptual understanding and desire to learn.”

Every Friday all of the teachers at Stewart Elementary



*Top: Before the start of the 2017-2018 school year, educators at Stewart Elementary, were trained in pedagogy and how to teach and learn using a 3D science model.*

*Bottom: After completing the training, educators at Stewart Elementary School visited Rexburg, Idaho, to watch the solar eclipse.*

School have the autonomy to spend an hour teaching their passion or supporting students as they explore their individual interests. Each teacher calls the time something different but it is a coveted time when instruction does not necessarily have to be tied to what students learned that week. Students participate in additional STEM challenges, robotics, independent research, and arts integration during this time.

“We want to give students more ownership of their learning,” Keller said. “We want them to ask questions, to struggle a little bit and come up with the wrong answer sometimes, and then have the internal drive to solve the problem. We grow the most when we learn from our own mistakes. We are encouraging a growth mindset in our students.”

Alicia Madsen, a sixth grade teacher at Stewart Elementary School, who completed the Elementary STEM Endorsement last year, says that implementation has been successful.

“Each month we do a STEM challenge with our students,” Madsen said. “It doesn’t have to be a major project, our last challenge consisted of using dry spaghetti noodles and gum drop Christmas trees to build a structure that would support a Christmas tree topper. Students used the engineering process, researching how structures are built, and then designing a prototype, testing it, and redesigning.”

One month, for the STEM challenge, students watched ice melt in boiling water and had to explain at a molecular level what was happening.

“This activity required students to not only think at a more complex level, but to learn how to communicate their findings through writing, discussion and presentations,” Madsen said.

With more than eight years of experience in education, Madsen says that of all the professional development opportunities, the Elementary STEM Endorsement Program has been the most impactful, helping to develop her problem solving and critical thinking skills, so that she can teach her students how to do the same.

“Truthfully, the endorsement was so valuable that if I could take the course again, then I would,” Madsen said.

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