



# Engineering Success

How a high-poverty school's focus on STEM helped it go from a C rating to an A

By Marissa Ogando

**T**he slogan at Whitesburg Elementary School (WES) is “We Engineer Success.” As a Title I school in a small, rural community, we “own” the fact that our children will have to compete with children who have different experiences and levels of opportunity, and we want to ensure they are college- and career-ready. And an effective science, technology, engineering, and

mathematics (STEM) program is a key part of that.

Here are six strategies WES has implemented to create an effective STEM program from the ground up since I became principal in 2014:

1. **Provide professional development (PD) and develop your skills alongside your teachers.** As part of our first foray into STEM,

teachers participated in a variety of PD courses in which they learned how to implement STEM projects in the classroom. As the months passed, however, we realized that our STEM program wasn't consistent schoolwide, and that many of our teaching methods were stuck in the past.

2. **Get certified.** To deliver a better program, the assistant principal

and I registered for the National Institute for STEM Education (NISE) campus certification program at the same time five of our teachers were completing the National Certificate in STEM Teaching. The process allowed us to learn together, support each other, and apply the strategies immediately in classrooms.

3. **Focus on the thinking, not the building.** We thought STEM was about making and building—and buying the supplies that go along with that. One of our biggest aha! moments was when we found out that STEM is less about the build and more about the problem-solving. Now we encourage students to think through problems and come up with suggestions and solutions, instead of having them build something just because it's a hands-on activity.
4. **Emphasize the standards, the Four C's, and the Five E's.** Good

STEM instruction meets state standards and helps students master critical thinking, creativity, communication, and collaboration—the Four C's critical to success in college and career. We use a STEM curriculum that's developed around the Five E's model of instruction—Engage, Explore, Explain, Elaborate, and Evaluate—to help students build a deeper understanding of the concepts they're studying.

5. **Do STEM daily, and integrate it with other subjects.** In our school, STEM crosses into every content area. For example, if fifth-graders are learning about area and perimeter in math, we might ask them to design a zoo. We give them a budget and ask them about the animals, why they chose them, and their diets and habitats. We then ask students to design enclosures for the animals, which brings

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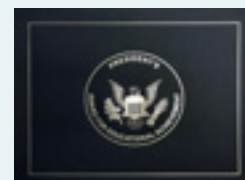
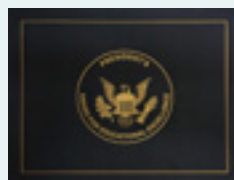
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in area and perimeter. Giving students real-world challenges shows how they can apply their knowledge in the future.

- 6. **Help students know that failure is an opportunity to learn.** Flexibility, adaptability, and persistence are skills that can be learned from STEM activities and skills that are valued in the workplace. When students conduct an experiment that doesn't yield the expected results, we encourage them to look at those experiences as opportunities to learn, grow, and try again.

We strive to give students a safe place to take risks, providing them with context for each STEM activity and a reminder that learning takes time. We help them focus on the

process—not just the outcome—because they can learn from the outcome and try again. Students should understand that everyone is on a learning journey and that just because we haven't accomplished something yet, it doesn't mean we can't or won't. It helps them persevere.

**Achieving Results**

STEM is improving learning across all subjects. Students' curiosity is piqued, and they are excited to come to class. Instead of depending on the teacher for answers, they find their own or work with their peers to find a solution. Our students are no longer passive learners, and they will be able to tackle real-world challenges because they can problem-solve, rather than waiting to be told what to do.

Since 2014–2015, student performance has improved in every subject area. On the College and Career Ready Performance Index, our school's score rose from 71.9 in 2015 to 90.3 in 2017. The school's overall performance is now higher than 90 percent of schools in the state, discipline referrals have decreased dramatically, and the community and district are invested in the work we're doing.

In 2018, we became the first school in Georgia to earn a National Certificate for STEM Excellence. But our greatest achievement is teaching all children that they are scientists, technologists, engineers, and mathematicians, and that they can take on the world. **P**

**Marissa Ogando** is the former principal of Whitesburg Elementary, a Title I school in the Carroll County (Georgia) School System.

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