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Leadership ♦ STEM/STEAM

LAUNCHING A STEM ACADEMY

written by Jonas Greene, Guest Author | June 25, 2020



National trends show the **STEM job market** is increasing exponentially. Students, however, are not always prepared to pursue those careers. In **Lewisville ISD** (LISD), our goal is that all of our students enjoy thriving, productive lives, and we want to make sure the programs we create are preparing them for that future.

To help us create programs that provide rich learning opportunities for students, LISD surveyed parents and found that the vast majority wanted to see an increase in STEM programming. These factors led to the district designing and developing its first **STEM Academy**. The following are a few strategies we have implemented to make our vision for STEM teaching and learning a reality.

Start Early and Support the Transition to a STEM Focus

We began preparing for the opening of the first STEM Academy at Donald Elementary about 18 months in advance, working with campus leaders, teachers, parents, and the community. We wanted to assure our community that our STEM Academy would be built on research and best practices in STEM, so we initiated a partnership with the **National Institute for STEM Education** (NISE) in 2017. The NISE certification process offers teachers professional learning and best practices in STEM education. It also provides accountability so our community knows that an LISD STEM Academy is not just something we labeled "STEM," but would be vetted and recognized nationally by an outside organization.

During the 2017-18 school year, 22 teachers at Donald Elementary completed the National Certificate for STEM Teaching (NCST). With the support of a virtual STEM coach, they developed digital portfolios demonstrating their understanding of 15 STEM Teacher Actions across three domains: Creating an Environment for Learning, Building Scientific Understanding, and Engaging Students in Science and Engineering Practices. Additionally, the school completed its requirements for the National Certificate



for STEM Excellence (NCSE)–Campus Certificate, developing a digital portfolio demonstrating the application of the 15 STEM Teacher Actions.

The LISD STEM Academy at Donald Elementary earned the NCSE–Campus Certificate in May 2018 and opened its doors to students in fall 2018. Since then, the program’s popularity in the LISD community has led to its expansion to other campuses. The LISD STEM Academy at Polser Elementary and LISD STEM Academy at Valley Ridge Elementary opened for the 2019-20 school year. To date, more than 60 teachers have gone through the certification process. Our district has plans to open additional STEM Academies in the coming years.

Motivate STEM Academy Teachers to Learn by Making It Voluntary

One key to our program’s success is that it is all voluntary. Leaving it up to people to be intrinsically motivated to learn creates more interest than if we had required them to get the certification — and teachers are more interested than we ever imagined.

All of the principals, assistant principals, and instructional coaches at the STEM Academies have also gone through the certification process, and they worked alongside the teachers. It is helpful for them to know what teachers are learning so they can support them in the learning process as well as during implementation.

Create an Integrated STEM Program that Students Experience All Day Long

Our STEM Academies integrate STEM practices into all instructional areas, including language arts, math, science, social studies, physical education, art, and music. They also provide instruction in engineering every day for every student. Since there were no state standards for engineering in the elementary grades, LISD designed its own. In addition, students experience instruction in robotics, computer programming, and career exploration. The instructional hours at a STEM Academy are 25 minutes longer than a typical LISD school day to allow for additional STEM learning experiences.

As part of the integrated STEM curriculum, students learn content through project-based learning. We integrate inquiry-based learning and problem-solving across the content areas. We call our model of instruction “STEM Plus.”



Build a Common Vocabulary

Having a common vocabulary helps us talk about what we mean by STEM in our STEM Academy program. For example, before our launch, there were misconceptions about “integration” being the same as “replacement.” Many teachers thought if they did an engineering task, then they did not have to teach science that day. However, science skills are critical to the engineering tasks students are working on. Integration is not about replacing; it is about making connections from one content area to another. Having this common vocabulary helps ensure that every stakeholder is on the same page.

Make the STEM Academy Replicable

The STEM Academy program, which is an LISD school choice program, has attracted new students, resulting in increased enrollment at the three elementary schools. During the application period for 2019-20, parent information sessions were attended by more than 400 families, and the district received applications for more than 450 students.

Having a streamlined method of professional development and curriculum development has helped expedite the replicability of our STEM Academy program. While each campus has its own personality and culture, the certification process helps us ensure the program offers the same quality and standards at every campus. Our STEM Academies are already seeing positive changes. For example, students are showing more creativity and critical thinking, and they are excited about learning and enjoy going to school. That is our goal — not to improve a test score, but to create engaging learning experiences that help each student develop creative thinking and problem solving skills.

Photos courtesy Lewisville ISD.

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