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TESOL Connections

Keeping English language professionals connected

Quick Tip: 3 Ways to Connect STEM and Language Learning

by *Deborah Cortez*

For English language learners (ELLs), science, technology, engineering, and mathematics (STEM) activities can create an engaging environment for development. In San Elizario Independent School District (ISD), our student population is 99% Hispanic, 96% economically disadvantaged, and 50% proficient. We emphasize hands-on, inquiry-based STEM learning from preschool through high school, and we have found that this approach is beneficial in a variety of ways.

Here are three ways to actively engage students in STEM while providing rich opportunities for English language development.

1. Host a STEM Expo

Each year, we hold a STEM Expo in our elementary, middle, and high schools. We invite students to submit an “invention,” which they create using what already exist, or an “innovation,” which they create from scratch. Because we do not want to limit their creativity, we encourage our students to think and perceive as needed based on their own passions. In addition, we do provide websites and encourage them to watch shows like *Shark Tank* so that the process works. Students can work on these STEM projects individually or in pairs or small groups. Working in pairs or groups is particularly beneficial because it allows them to speak and listen to English in a friendly, low-pressure environment. This hands-on, collaborative learning also makes academics come to life.

In the spring, the winning students from each school present their STEM invention or innovation to a panel of judges at a district-wide competition. They further develop and refine their English skills, and it builds their confidence in a supportive, fun environment.

2. Use the 5E Model of Instruction

In Grades K–8, we use a digital STEM curriculum called *STEMscopes*, as well as a Spanish version of the program that’s available for Grades K–5. It was developed around the *5E model of instruction*—Engage, Explore, Explain, Elaborate, and Evaluate—with additional modules for intervention and acceleration.

In the Explore portion of each unit, students conduct inquiry-based science investigations. For example, in one fifth-grade investigation into light, students use various tools, such as mirrors and a laser pointer, to test refraction and reflection. During the Explain phase, students collaborate in groups and use what they know to share their explanations of the Explore activities. In the Elaborate phase, students are challenged to extend their conceptual understanding and apply it through cross-curricular connections to reading, math, engineering, and other areas. Our teachers say that the Explain and Elaborate phases are particularly beneficial for ELLs, and that students are now more willing to participate and take chances with vocabulary in the classroom.

3. Use Engineering to Promote Scientific Inquiry and Literacy

As part of the 5E model’s Elaborate phase, our K–6 students also participate in an engineering project once every 9 weeks. These “engineering connection” projects give students the opportunity to apply what they’ve learned to real-world problems through group design projects. In one engineering connection focused on water filtration, students are asked to design, construct, and test a filter system to remove impurities from dirty water. Our projects come from *STEMscopes* curriculum and we find ideas for other projects on websites like the *Jet Propulsion Laboratory at NASA*. Students research, brainstorm, explore, build, test, and adjust—many opportunities for language development. In fact, students enjoy these projects so much that many showcase them at the STEM Expo.

Hands-on STEM learning creates a natural environment for language development. It gives students opportunities for reading, writing, listening to, and speaking English and exposes them to academic English, which is essential for college and career readiness.

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