Relevance in Education Fosters Success in Life

by Patrick G. Forrester

In 2008, I was invited to speak at a STEM Institute in Upstate South Carolina. It was an experience that would influence my thinking over the next several years and eventually bring me to Clemson University and the State of South Carolina. I began to consciously reflect on the impact that education had had on my life and how most of my career experiences were a direct result of that education. I began to better understand the tremendous investment that teachers had made in my life and the way that I had been shaped by experiences in my home. It was during this time of reflection that Dr. Bill Havice extended an invitation to spend time at Clemson University to promote integrative STEM education. I was intrigued by the offer to collaborate with the work he was doing in the surrounding school districts. The result is my journey through STEM education.

Ray McNulty, Chief Learning Officer at Penn Foster, says, “The primary aim of education is not to enable students to do well in school, but to help them do well in the lives they lead outside of school.” I realized that this was my story. Everything that my teachers had poured into my education had allowed me to do well in life. I now had the opportunity to do that for others.

Over time I broadened my knowledge of STEM. I began to grasp and embrace the concept of integrative STEM education which Mark Sanders defines so well. Integrative STEM is not another thing to teach, but is a way to teach that has the greatest potential to impact students’ education and their lives outside of school.

Student Engagement

Integrative STEM education, I believe, is the key to student engagement. Children become more excited and confident in math and science when using technology, innovation, design, and engineering to make school subjects personally meaningful or relevant. At the same time, project-based STEM education can inspire learners to obtain a deeper knowledge of the subjects and motivate them to do quality work. Finally, it can help students make the connection between classroom learning, their everyday lives, and the broader world.

At NASA’s Jet Propulsion Laboratory in Pasadena, California, the head of human resources said he was having trouble replacing his master problem solvers. He had top candidates from Harvard, MIT, Caltech, and elsewhere, but he found that even though they were brilliant, they weren’t innovative in dealing with problems the way their predecessors had been. He realized that his best problem solvers had been kids who were tinkerers, who built sand castles, and who took computers apart with their friends so they could understand their guts.

I grew up a tinkerer. My parents allowed me to take things apart and put them back together. After I turned 16, our driveway came to look like an auto shop as my 1966 Mustang was in a constant state of disassembly. I developed confidence and self-direction. I learned how and why things worked. This was integrative STEM in action, and it helped give shape and meaning to the human-made world I lived in. It would eventually open doors to all kinds of learning.

STEM Labs Bring Relevance

Unfortunately, not every child has the opportunity to learn about technology, engineering, and problem solving at home. But I think this type of learning is possible through the implementation of fully-functional integrative STEM or Engineering Labs in the elementary school environment. In fact, I observed it happening in two elementary schools. (One school’s story can be found in the article by Melida Reeves in this issue.)

A dedicated STEM Lab can bring relevance to the student’s coursework as it focuses on project-based, integrated implementation of all of their subjects. The STEM Lab can be an amazing environment for learning and innovation that combines the design process with math and science (and even the arts) to help students create and solve problems as they design and build just about anything.

The idea of incorporating a STEM Lab in the elementary school provides the opportunity to integrate multiple subjects into singular projects. The long-term relevance of the STEM Lab is apparent as it helps students develop life skills and opens their eyes to the world around them while preparing them for their futures.

Students around Clemson, throughout South Carolina, and across the United States need a school experience that prepares them for success in life long after they have left the classroom. They need to work on real-world, open-ended problems and projects. They need to learn the design process and creative thinking, how to work together in teams, how to solve problems, and how to accept and learn from failure. They need to be taught the skills they will need to excel in challenging college courses and survive and succeed in today’s job market.

They need integrative STEM education, and I believe that the dedicated Engineering or STEM Lab is the best place for that to happen.

—Patrick G. Forrester, COL USA Retired, Astronaut, National Aeronautics & Space Administration Visiting Faculty, College of Health, Education, and Human Development Clemson University, Clemson, SC forres5@clemson.edu