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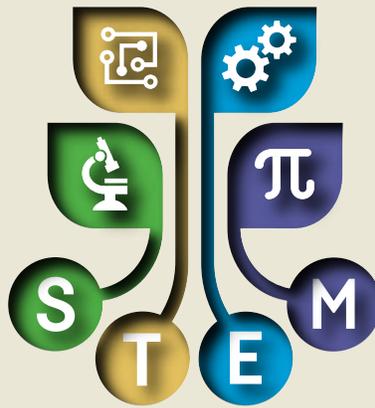
“Why Do I Need to Know About STEM?”

I Don’t Teach Science, Technology, Engineering, or Math!”

We live in a changing world. The COVID-19 shutdowns illustrated just how quickly life can change. Many educators were forced into distance or hybrid learning with little time to prepare or plan. They continue to implement safety protocols that are constantly evolving, illustrating the adaptability and professionalism of teachers. Concurrently, the education pendulum continues to swing, drawing our focus toward various aspects of teaching and learning, despite the global pandemic.

The current trend of integrating STEM throughout the curriculum was not common in education when I started teaching in 2005; however, today most educators are familiar with STEM and related terms such as STEAM or STREAM.¹ Whether or not teachers teach a STEM subject, most agree that they want their students to be successful, both now and wherever God leads them in the future. They want their students, regardless of chosen occupation, to understand advances in science and participate in making decisions and ethical choices that will impact society. How do we, as educators, achieve these goals when we don’t know what jobs or societal challenges will exist in the future? Can we prepare our students to be dedicated, Bible-believing Christians as well as great scientists? STEM is essential, just as reading, writing, and history are essential; we must equip students to succeed in a changing world.

Advances in travel capability and technological innovations have exploded in recent history; thus, students’ need for strong STEM skills is evident. For example, if we think back to the time when Jesus lived, most people traveled by foot, on an animal, in a chariot,



and by boat. Fast forward to the Age of Discovery and Exploration (the 1400s-1600s). Although explorers had begun to traverse distant seas, most people still traveled by foot or small animal-drawn carts. Only a few traders, missionaries, and explorers traveled to faraway places by boat. By the 1800s, train travel became an affordable option for many²; however, it wasn’t until the 1920s to 1950s, as automobiles and commercial airlines became popular and accessible, that large numbers of people began regularly traveling greater distances.

Technology has changed significantly in recent years. It has only been within the past 40 years that computers have downsized from huge mainframes owned only by large companies to small hand-held smartphones that fit in our pockets. Today, information is shared so quickly and easily that misinformation spreads faster than ever before. As a result, the need to equip critical thinkers who can analyze information, check sources, and solve problems in creative ways is also greater than ever.

Training students to be resilient problem-solvers, effective communicators, and creative thinkers can occur in any class, no matter the subject content or grade. Project-based learning is one example of a teaching method used across the curriculum and at various learning levels. Students can work together on meaningful projects that address real-world problems and, in the process, learn how to collaborate and work cooperatively. This process also helps them sharpen their inquiry and listening skills. In addition, many laboratory experiments conducted at the tertiary level require collaboration with a lab partner. Perhaps due to limited resources, schools at all levels encourage students to work together in groups to share expensive

Continued on page 51

Guest Editorial *Continued from page 3*

equipment while doing science. But what few realize is the value of cooperative learning experiences. God's Word is clear, "Two are better than one, because they have a good return for their labor: if either of them falls down, one can help the other up" (Ecclesiastes 4:9, 10, NIV).³ Do you provide your students regular opportunities to work collaboratively in project-based learning experiences so that they can sharpen their communication and cooperation skills?

Many business professionals suggest that critical skills such as teamwork, organization, decision-making, and communication are needed to succeed; these are referred to as "soft skills." Although these skills aren't measured on standardized tests nor usually assessed on a report card after kindergarten, they are essential because most jobs require working with others. In the book *The Global Achievement Gap*, Tony Wagner, former professor at Harvard University, outlines seven skills teens need to succeed today.⁴ Many of these skills—along with design thinking⁵—are incorporated into the *Mission: Invent*⁶ project, which the STEM Division of Andrews University (Berrien Springs, Michigan, U.S.A.) has designed for Adventist educators.

The *Mission: Invent* initiative provides free curriculum and resources to Adventist educators so that they can do more collaborative problem-solving with their students. *Mission: Invent* incorporates elements of the traditional science fair with trifold boards and judges, but participants must work in teams using engineering design processes. Groups of students tackle a real-life problem, designing and building a prototype of a possible solution to their chosen problem. This opportunity builds 21st-century skills and focuses on integrating STEM with Bible classes and the humanities. I hope you will consider being a part of *Mission: Invent* in the future. If you are interested in learning more, check out this website: <http://andrews.edu/go/invent>.

Great teachers are always learning. They have a growth mindset and are willing to take on challenges. They are open to new methodologies, activities, and curriculums because they want the best for their students. Exceptional teachers want their schools to be communities of active learners engaged in excellence in all areas of education, including biblical studies, the humanities, the sciences, arts, collaboration, and service-learning.

The theme of this issue is revitalizing Adventist education through STEM. We want our students well prepared to succeed at the next level, whether the next grade up, academy, careers, college, or graduate and professional schools. In this issue and the next, you will find various topics geared for small schools and others that can be adapted for use by any K-16 teacher. We hope

this issue will equip teachers and parents with additional tools to implement in their classrooms. If you have a growth mindset, you will doubtless be able to glean gems from any of the articles to implement immediately, whether or not you teach a STEM subject. ✍

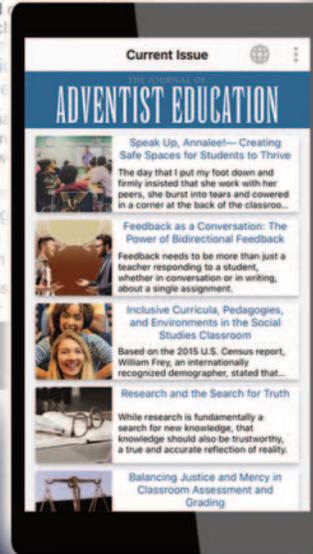
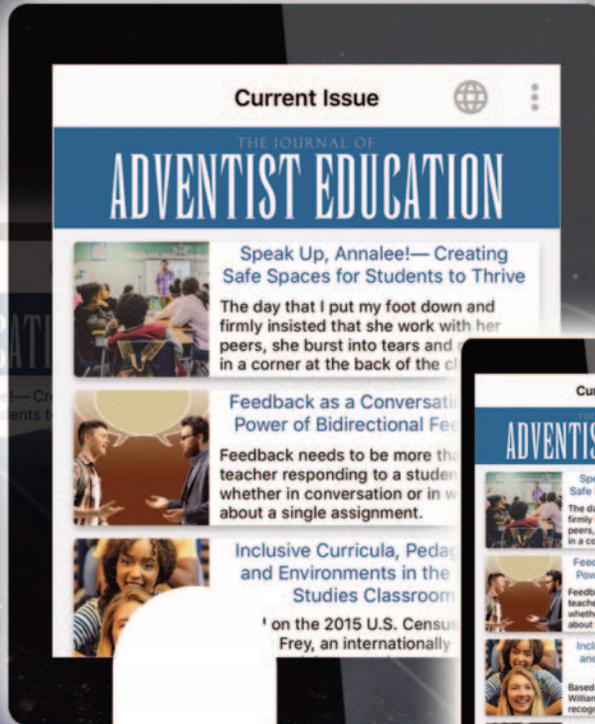
Monica Jackson Nudd, MEd, is the STEM Coordinator for the College of Arts and Sciences at Andrews University (Berrien Springs, Michigan, U.S.A.), and the Coordinator for this special issue. She earned a Master's degree in curriculum and instruction with an emphasis in math from the University of Maryland and previously served as a teacher and principal in Adventist elementary and middle schools. Her areas of interest include problem-based learning and building support for STEM at all levels.

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NOTES AND REFERENCES

1. There are several acronyms used throughout this issue and in the literature on this topic: STEAM includes the arts, and for this issue, agriculture. STREAM includes reading, and for this issue, religion.
2. World Railroad Records and Firsts (2022): https://www.railservice.com/stats_records/railroad_firsts.html.
3. Ecclesiastes 4:9, 10, *New International Version* (NIV). Holy Bible, New International Version®, NIV® Copyright © 1973, 1978, 1984, 2011 by Biblica, Inc.® Used by permission. All rights reserved worldwide.
4. Tony Wagner, *The Global Achievement Gap* (New York: Basic Books, 2008). Wagner lists seven key survival skills for the new world of work: critical thinking and problem-solving; collaboration; agility and adaptability; initiative and entrepreneurialism; effective oral and written communication; accessing and analyzing information; and curiosity and imagination.
5. "Design thinking" is one of the latest buzz phrases in the education world. This new teaching strategy doesn't fall under STEM, although engineers tend to use design thinking in their processes. Nor does design thinking fall under humanities or the arts; it is a business principle. We don't teach business at the elementary or secondary levels. However, design thinking requires collaboration and problem-solving skills, creative thinking, and grit, which will be well worth your time investment—and your students will reap the benefits.
6. The *Mission: Invent* program seeks to engage K-12 Adventist educators in STEM by providing training, support, and nurture as they seek to equip students to think critically, solve real-world problems, innovate, and create opportunities for entrepreneurial endeavors. For more information, visit <https://www.andrews.edu/cas/stem/invent/index.html>.



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