For the last several years, concern has been brewing about America’s underinvestment and underperformance in science, technology, engineering and mathematics—the fields collectively known as STEM. What is STEM, and why is it drawing so much attention? STEM can be described as an “initiative for securing America’s leadership in science, technology, engineering and mathematics fields and identifying promising strategies for strengthening the educational pipeline that leads to STEM careers.”

The elements of STEM are integral parts of our nation’s critical economic sectors, from health care to energy, infrastructure and national security.

STEM careers include not only those requiring a research-based advanced math or science degree, but a broad range of related occupations in areas as diverse as aquaculture, automotive technology, accounting and architecture. More careers than ever before require a deep understanding of STEM principles. Unfortunately, the supply of STEM talent is not increasing to meet the growing need. Two main factors are affecting the supply side of the STEM equation. First, the looming retirement of the baby boom generation will significantly affect the STEM labor force. The number of current scientists and engineers retiring will increase rapidly over the next decade. Second, too few students are currently choosing to prepare for STEM careers. The United States is standing still or falling behind in terms of producing its home-grown STEM talent. At the same time, other nations, particularly population-rich ones like India and China, are rapidly increasing the number of STEM professionals that their secondary and postsecondary education systems produce.

While some of the dearth of STEM professionals can be attributed to lack of interest, there is growing concern that students are not gaining the foundational skills necessary to be successful in STEM career areas even if they choose that path. Low student performance is evidenced on the U.S. National Assessment of Educational Progress. Math scores for 17-year-olds were significantly unchanged from 2004 to 2008, despite the fact that students are taking more and higher-level math courses in high school. In fact, test results showed that 41 percent of those students did not even have an under-
CTE programs and related initiatives provide key advantages in addressing the STEM challenge and securing America’s leadership in innovation.

CTE programs, integrated with active career exploration and career advising, help students understand the breadth of careers that have a relationship to STEM and the varied pathways that can lead to those careers. Courses in areas like aviation and aerospace, information technology, engineering, game design, health care, nanotechnology, and simulation and robotics expose students to curricula and the varied pathways that can lead to these careers, helping them to understand the breadth of STEM careers. During the sophomore year, students enrolled in PLTW courses in engineering and biomedical sciences.

Meeting the Challenge

In an always-growing, flattening, global economy, the United States is facing strong international competition in STEM areas. Fortunately, schools and colleges in the United States are rising to the challenge by offering rigorous, relevant CTE programs with content strong in science, technology, engineering and mathematics. The nation’s economic leadership, inherently linked to STEM achievement, will not be maintained without support for critical CTE programs that build student interest and skills in STEM areas. Through the thoughtful investment in STEM-intensive CTE programs, America can readily increase its supply of motivated and prepared students entering STEM-related fields and strengthen the general STEM literacy of the emerging U.S. workforce.

Since 1997, when Project Lead the Way (PLTW) was launched as an independent not-for-profit organization with 11 high schools participating, PLTW’s pre-engineering program has experienced rapid growth. By 2009, approximately 3,000 middle and high schools were participating in the effort, with 250,000 students enrolled in PLTW courses in engineering and biomedical sciences.

This is significant headway in reaching the goal of producing 400,000 scientists and engineers annually.

At Lake Travis High School—LETI in Texas, the PLTW curriculum is used as part of the Institute of Math, Engineering and Architecture. LETI is using an integrated, cohort-based approach to implementing PLTW. African American and Latino students participate in the effort, with 250,000 students enrolled in PLTW courses in engineering and biomedical sciences.

In 2009, approximately 3,000 middle and high schools were participating in the effort, with 250,000 students enrolled in PLTW courses in engineering and biomedical sciences.
projects and college connections. Much of the expansion and integration of the engineering program at Lake Travis has been made possible by a grant from Siemens Building Technologies. Siemens was looking for a school district to model and disseminate best practices in high school engineering programs.

Due to the highly recognized post-secondary engineering programs at Austin Community College and the University of Texas, Lake Travis was selected to participate. The grant has provided business and industry internships for academic and CTE teachers, common planning time to enhance curriculum integration, partnerships that connect students with the professional STEM community, and prepares them for postsecondary success.

The Concerns: too few STEM Professionals

It is widely recognized that the United States is facing an anticipated shortage of scientists and engineers. Despite the increased importance of the STEM fields, data show that the number of college students who are pursuing degrees in STEM fields has remained relatively stable. This means that the United States is working to train the next generation of researchers, innovators, and entrepreneurs to meet future workforce demands. Statistics show that many students choose to pursue careers in STEM fields, but too often, they do not live up to the expectations of their parents, community members, and themselves.

The Act of inaction is the act of doing nothing. It is the act of allowing what is undesirable to continue without doing anything about it. It is the act of making no effort to correct or change something that is wrong or undesirable. It is the act of not taking any action to improve a situation where there is a potential for improvement. It is the act of not doing something that could be done to achieve a desired outcome.

The Necessity of Action

The Necessity of Action is the act of taking action. It is the act of doing something to achieve a desired outcome. It is the act of taking the necessary steps to correct or change something that is undesirable. It is the act of making an effort to improve a situation where there is a potential for improvement. It is the act of doing something that could be done to achieve a desired outcome.

The Necessity of Action is the act of taking action. It is the act of doing something to achieve a desired outcome. It is the act of taking the necessary steps to correct or change something that is undesirable. It is the act of making an effort to improve a situation where there is a potential for improvement. It is the act of doing something that could be done to achieve a desired outcome.

The Necessity of Action is the act of taking action. It is the act of doing something to achieve a desired outcome. It is the act of taking the necessary steps to correct or change something that is undesirable. It is the act of making an effort to improve a situation where there is a potential for improvement. It is the act of doing something that could be done to achieve a desired outcome.

The Necessity of Action is the act of taking action. It is the act of doing something to achieve a desired outcome. It is the act of taking the necessary steps to correct or change something that is undesirable. It is the act of making an effort to improve a situation where there is a potential for improvement. It is the act of doing something that could be done to achieve a desired outcome.

The Necessity of Action is the act of taking action. It is the act of doing something to achieve a desired outcome. It is the act of taking the necessary steps to correct or change something that is undesirable. It is the act of making an effort to improve a situation where there is a potential for improvement. It is the act of doing something that could be done to achieve a desired outcome.

The Necessity of Action is the act of taking action. It is the act of doing something to achieve a desired outcome. It is the act of taking the necessary steps to correct or change something that is undesirable. It is the act of making an effort to improve a situation where there is a potential for improvement. It is the act of doing something that could be done to achieve a desired outcome.

The Necessity of Action is the act of taking action. It is the act of doing something to achieve a desired outcome. It is the act of taking the necessary steps to correct or change something that is undesirable. It is the act of making an effort to improve a situation where there is a potential for improvement. It is the act of doing something that could be done to achieve a desired outcome.

The Necessity of Action is the act of taking action. It is the act of doing something to achieve a desired outcome. It is the act of taking the necessary steps to correct or change something that is undesirable. It is the act of making an effort to improve a situation where there is a potential for improvement. It is the act of doing something that could be done to achieve a desired outcome.

The Necessity of Action is the act of taking action. It is the act of doing something to achieve a desired outcome. It is the act of taking the necessary steps to correct or change something that is undesirable. It is the act of making an effort to improve a situation where there is a potential for improvement. It is the act of doing something that could be done to achieve a desired outcome.