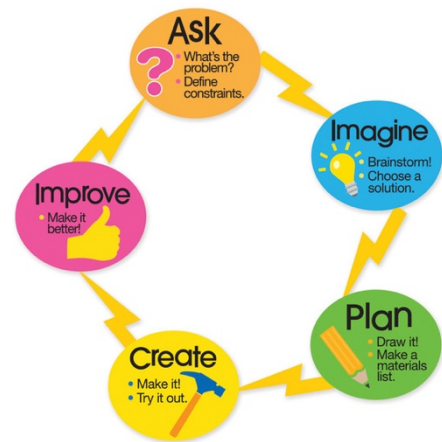


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STEM: *A Growing Controversy*

Education is an evolving process that consistently introduces new theories and practices based on the most recent research obtainable. One of the latest introductions into the education world is STEM education which focuses on the core subjects of science, technology, engineering, and mathematics.

According to a Grace Chen in a public school review, “STEM can be defined as the creation of a discipline based on the integration of other disciplinary knowledge into a new ‘whole.’ This interdisciplinary bridging among discrete disciplines is now treated as an entity, known as ‘STEM’.” STEM is a curriculum based on the idea of educating students in four specific disciplines- science, technology, engineering and mathematics- in an interdisciplinary and applied approach. Rather than teach the four disciplines as separate and discrete subjects, STEM integrates them into a cohesive learning paradigm based on real-world applications. STEM was first introduced by Judith A. Ramaley, the former director of the National Science Foundation’s education and human resources division. Since 2001, the acronym has been a regular part of the vocabulary used in the world of education.



According to Dr. Patricia Fioriello, the National Science Foundation estimates that 80% of the jobs available during the next decade will require math and science skills. Along with the benefits STEM gives to the U.S. workforce, there are also individual pros/benefits to students. These pros of STEM include: equality in education, teaching independent innovation, allows students to explore subjects at a greater depth, and helps students develop critical thinking skills. STEM also provides students with the skills they need to become better prepared for the fast-paced college curriculum which will guide them to a rewarding and well-paying career in the future.

But the STEM movement goes far beyond preparing students for specific jobs. STEM develops a set of thinking, reasoning, teamwork, investigative, and creative skills that students can use in all areas of their lives. STEM isn't a standalone class—it's a way to intentionally incorporate different subjects across an existing curriculum.

There are four main models of STEM. The four models include the exploratory model, the introductory model, the partial immersion model, and the full immersion model. The exploratory model describes a traditional school experience with STEM-related extra curricular opportunities offered to students in addition to the regular school day. The introductory model describes a traditional school experience with STEM-related experiences offered in addition to the current curriculum. Thirdly, the partial immersion model describes a school experience where STEM-related experiences are integrated into the current curriculum. Lastly, the full immersion model describes a total school experience where STEM-related experiences are imbedded within a cross-curricular, thematic focus in all content areas. Full immersion schools look more like 21st century workplace environments rather than 20th century K-12 school environments (Science Foundation Arizona 2).

As each program has its drawbacks and cons, STEM's main negative focal point is in regards to its guidelines. STEM does not provide straight forward guidelines for educators to follow as they develop their own STEM models within their schools. Chen breaks down STEM into elementary and high school levels. She describes STEM in a high school setting to be consistent until change occurs. Elementary school classrooms run differently than a middle school or high school does. In elementary school, teachers are required to teach all subjects instead of teaching one subject based on their targeted strength. Chen continues to describe the downfalls of STEM in elementary schools.

At the elementary level, STEM progress becomes even more dismal, as few teachers qualified to teach in the areas of math or science are found in primary schools. Currently, there are no national standards for STEM education or for teacher certification in these programs. As a result, STEM education is somewhat disjointed and inconsistent throughout the country, leaving parents and students unsure of what type of quality STEM education is actually being offered at their local schools. (Chen 2)

There are many potential advantages to STEM education. The idea of STEM has received mounds of support from government leaders, educators, administrators, business members, and students alike (Chen 2). Overall, STEM provides students with the knowledge and skill they need to build and grow into successful leaders. With training and guidelines for teachers, STEM could grow and advance into a program that many states would approve of within their educational systems.

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