Defining S.T.E.M.
A Summary of Selected Definitions
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Science, technology, engineering and math are collectively known as S.T.E.M. This term is often defined differently, depending on the context. There are several perspectives or lenses through which agencies define STEM. These include a STEM jobs perspective, a student competency perspective, workforce knowledge and skills perspective, and an integrated curricula perspective.

A Federal Definition – a STEM jobs perspective
In 2011, the U.S. Office of Vocational and Adult Education utilized the following definition:

Since “STEM” is used in a variety of ways, it is useful to consider what it means in this particular report... the authors note that while the acronym STEM is reasonably precise—referring to science, technology, engineering, and mathematics—there is no standard definition of a STEM job. This Department of Commerce report defines STEM jobs as those including professional and technical support occupations in computer science and mathematics, engineering, and life and physical sciences. The definition also includes three management occupations closely tied to STEM—computer and information systems, engineering, and natural science managers. (Education jobs and social science jobs allied with STEM fields are not included. Future discussions in OVAE Connection will look at STEM aspects of education.) (3)

The National Governor’s Association Definition – a student competency perspective
In December 2011, The National Governor’s Association published Building A Science, Technology, Engineering and Math Education Agenda: An Update on State Actions. For the most part, the NGA definition of STEM simply means fields of study or work that are generally labeled science, or technology, or engineering or math. However, the NGA analysis of the problem is instructive and provides some hints at the need for more systemic change. (p.5)

“The reasons the United States lags behind its competitors in producing STEM graduates have been well documented. They include:

• Lack of rigorous K–12 math and science standards. Standards in math and science have varied greatly across states and, in many cases, do not test students’ abilities to utilize concepts and solve problems.
• Lack of qualified instructors. A shortfall in the numbers of qualified math and science teachers in the classroom is a chronic problem in the K–12 system; many classrooms are staffed by teachers with neither a certificate nor a degree in their assigned subject area.
• Lack of preparation for postsecondary STEM study. A student’s ability to enter and complete a STEM postsecondary degree or credential is often jeopardized because the pupil did not take sufficiently challenging courses in high school or spend enough time practicing STEM skills in hands-on activities.
• Failure to motivate student interest in math and science. In most K–12 systems, math and science subjects are disconnected from other subject matters and the real world, and students often fail to see the connections between what they are studying and STEM career options. (4)

A Private University’s Definition: a workforce knowledge and skills perspective
The Georgetown University Center on Education and the Workforce breaks the definition of STEM into areas of knowledge, skills, abilities, interests and work interests and values: (1)

<table>
<thead>
<tr>
<th>Stem Knowledge</th>
<th>STEM Skills</th>
<th>STEM Abilities</th>
<th>STEM Work Interests</th>
<th>STEM Work Values</th>
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</thead>
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The Hawai’i State Department of Education’s Definition – an integrated curricula perspective

According to a 2012 Report to the Hawai’i State Legislature, the Hawai’i Department of Education has a working definition of S.T.E.M.:

STEM education integrates the study of science, technology, engineering and mathematics by using scientific inquiry and engineering design as unifying processes. STEM emphasizes innovation and the development of problem-solving, critical thinking and collaboration skills through student-focused, rigorous, relevant, and authentic learning. (2)

SOURCES:
(1) Carnevale, Anthony P., Smith, Nicole, Melton, Michelle, STEM, Georgetown University Center on Education and the Workforce, October 20, 2011, at http://cew.georgetown.edu/stem/

(2) Hawai’i State Department of Education, Legislative Report: Relating to the State Budget (HB 200 HD1, SD1 CD1, Section 132, 2011, at http://doe.k12.hi.us/reports/tolegislature_2012/06_HB0200HB1SD1CD1Section%20132Act%20164(SLH2011).pdf
