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Is STEM Too Broad a Category?

By [Liana Heitin](#) on January 6, 2015 9:53 AM

By now, even if you have trouble remembering the words that make up STEM, you probably at least have a general sense of what the acronym refers to. (It's science, technology, engineering, and mathematics.)

Maybe you've even heard of **STEAM**—the movement to add "arts" to the grouping of subjects. Or perhaps you've come across arguments for **STREAM** (adding reading and art) or **STEMM** (STEM + medicine) or **STEMSS** (STEM + social studies) or even STEMFL (OK, I only saw this once, and it was in an ill-conceived press release arguing for the addition of financial literacy). The possibilities for expanding the acronym are, apparently, limitless.

But in a recent Vox piece, Danielle Kurtzleben writes that **STEM itself may be "too broad a classification,"** at least when looking at the job market. She cites a **2014 Government Accountability Office** report finding wide variability in employment and wages when STEM fields are further divided into health care, "core STEM" (i.e., life science, computer science, and math), and "other STEM" (i.e., architecture, psychology, and science teaching).

"STEM makes no sense as a category. What you have is science and engineering, and then you have this IT labor force," Hal Salzman, a Rutgers University professor of planning and public policy told Kurtzleben. "It's a nondifferentiated category that makes no analytic sense."

A recent report by the **National Academy of Sciences** also questioned the usefulness of lumping the STEM disciplines together. In education settings, doing so can give short shrift to some subjects (usually math) and "can place excessive demands" on students' attention and working memory, the report says. Teachers may also lack the content knowledge to teach all four disciplines.

But for many educators, STEM represents a necessary effort to integrate disciplines in a way that makes learning more "real world." Former Alabama teacher of the year Anne Jolly wrote in an **Education Week Teacher piece**, "It is a movement to develop the deep mathematical and scientific underpinnings students need to be competitive in the 21st-century workforce. But this 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."

The Next Generation Science Standards, which **a dozen states and the District of Columbia have adopted**, advocate just this kind of integrated learning. The standards require students to learn seven **cross-cutting concepts**, or themes that hold true across the science disciplines, and apply them in various fields..

But just as many educators are advocating to broaden the STEM acronym, it's worth asking the flip side: Is STEM already too broad? When is differentiating the categories more helpful for teachers and students?

And is it really more "real world" to combine science, technology, engineering, and math when STEM jobs, as Kurtzleben points out, can look so different from one another?

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