

# Innovation and STEM Schools

by Julia Link Roberts, Ph.D.

WHAT WORDS COME TO MIND WHEN THINKING ABOUT INNOVATION? Today, technology may be one of the first thoughts as technological innovations readily make the news. Another thought about innovation may be linked to entrepreneurship or creativity. “The success of the United States in the 21<sup>st</sup> century – its wealth and welfare – will depend on the ideas and skills of its population (President’s Council of Advisors on Science and Technology, p. 1). Innovation is key to a bright economic future.

How do schools with a focus on science, technology, engineering, and mathematics (STEM) fit in with state goals to increase innovation and to boost the economy? “STEM-focused schools represent a unique National resource, both through their direct impact on students and as laboratories for experimenting with innovative approaches.” (President’s Council of Advisors on Science and Technology, p. 14). These schools are certainly a unique national resource, and they offer outstanding opportunities to nurture young innovators. Although developing young professionals who will have the capacity to innovate must be intentional – it will not just happen.

So the question arises: In what ways do educators encourage creativity and innovation? A clear way to do so is to include creativity on the rubric for student products. “Unless teachers clearly state that they expect and will honor creativity, they are not likely to see creative approaches to products or various perspectives in viewing the content (Roberts, 2014, para. 6).” The Developing and Assessing Product (DAP) Tool (Roberts & Inman, 2015) includes creativity as one of the four components for assessing all student products. Students are challenged and expected to

present the content in a new way or with a different perspective as well as to express creativity in the product they develop.

Another way to encourage creativity is to ask lots of questions that do not have right answers. Having a storehouse of information is very important, yet creative thinkers will develop the capacity to problem solve using that valuable information. Classrooms and laboratories that encourage looking at phenomena in various ways will provide the culture and background that encourages creativity and, therefore, sparks innovation.

Of course, students must have a strong content background in order to think creatively about the content. An

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interdisciplinary focus is often key to innovation. That interdisciplinary perspective can come from one individual or from a team representing various disciplines. A variety of vantage points stimulate creative responses to a problem or question.

Sparks of innovation come from thinking about ideas

(content) in new ways. Creative problem solving is something to start early and to continue throughout a student’s education. Initially, some students will be not comfortable with problem-solving as there is not one right answer. Students may not have experienced taking risks (not knowing the right answer). Scientific discovery emanates from a question for which the “right answer” is not yet known, and perhaps there will be several possible solutions rather than a single right answer. Innovation comes from keeping the mind open for possibilities. New ideas come from staying open to the unexpected. Think of the discovery of penicillin and graphene.

Innovation is important to the economy of our states and nation. It is useful to know how your state measures up on the New Economy Index. Those data can help in spreading the word about the immediate and long-term impact students at your school can make in economic development, and they can be valuable sources of information when advocating for your school or for STEM education in general. A website for obtaining rankings on the Innovation Index is [<http://www.itif.org/publications/2014-state-new-economy-index>]. Categories on which states are ranked in this index are knowledge jobs, globalization, economic dynamism the digital economy, and innovation capacity.

“Innovation requires highly able, determined, and creative leaders and thinkers (National Science Board, p. 7).” Specialized STEM schools play an important role in educating young people as promising professionals who have the potential to be innovators today and in the future.

## REFERENCES

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