

OVAE CONNECTION

Report on Successful K-12 STEM Education (Continued From the Sept. 15 OVAE Connection)

The committee that prepared the report for the National Research Council, [Successful K-12 STEM Education](#), was charged with identifying highly successful K-12 schools and programs in science, technology, engineering, and/or mathematics (STEM) so that they could provide information to district, state, and national leaders to consider for improving STEM education. In response to its charge, the committee investigated three types of criteria for judging successful STEM schools and programs: (1) criteria related to STEM outcomes, (2) criteria related to STEM-focused schools, and (3) criteria related to STEM instruction and school-level practices. We summarize here the committee's findings on the first of these three criteria. We will discuss criteria two and three in subsequent columns.

With regard to the first criterion—outcomes—the committee addressed the question of “which outcomes should be used to identify effective STEM schools.” Student- and school-level achievement test data are the measures “... most commonly used to gauge success, regardless of the goals of a particular school or program.” The committee, however, cautioned that “[t]est scores ... do not tell the whole story of success.” Gauging the success of schools relative to the full set of education goals required using additional criteria. “Although it is difficult to measure interest and motivation (‘joy at the prospect of discovery’), creativity (‘a culture of innovation’), or commitment to ‘ethical behavior and the shared interests of humanity,’ it is essential to do so given the importance of preparing students to be leaders in STEM innovation – not just good test takers.”

The committee also found that the “strongest research comes from criteria related to practices, where the evidence allowed the committee to characterize effective STEM instruction, identify key elements that contribute to effective instruction, and identify school characteristics that support learning.” Instruction that is effective takes advantage of students’ “early interest and experiences, identifies and builds on what [students] know, engages them in STEM practices, and provides them with experiences to sustain their interest.” The committee found that effective STEM instruction is characterized by a “coherent set of standards and curriculum, teachers with high capacity, a supportive system of assessment and accountability, adequate instructional time, and equal access to quality STEM learning opportunities.” Research also indicates that effective elementary schools share common characteristics, including “strong leadership, professional capacity among teachers, strong ties to parents and the community, a student-centered learning climate, and instructional guidance for teachers.” These characteristics “support learning gains even in schools in areas of extreme poverty and hardship.”

Using Digital Badges to Help Identify Skills Acquired From Lifelong Learning

On Sept. 15, 2011, Secretary of Education Arne Duncan delivered remarks at the launch of the John D. and Catherine T. MacArthur Foundation's fourth annual Digital Media and Learning [Competition](#). Duncan discussed the important role that technology can play in lifelong learning. He was joined at the event by Under Secretary Martha Kanter, Director of Educational Technology Karen Cator, NASA Administrator Charles Bolden, and business, technology, civic engagement, philanthropic and other leaders.

“Learning happens everywhere and at every age. Traditional measures of achievement, such as high school diplomas, GEDs, and college degrees, cannot adequately convey the full range of knowledge and skills that students and workers master,” announced the foundation’s press release. To address this issue, the [foundation](#), in collaboration with [Mozilla](#) and [HASTAC](#) (the Humanities, Arts, Science, and Technology Advanced Collaboratory), announced a [Digital Media and Learning Competition](#) to find the most novel uses of new media to better support learning. This year's competition, among organizations, learning and assessment specialists, designers and technologists, will create and test badges and badge systems and “explore ways digital badges can be used to help people learn [and] demonstrate their skills and knowledge.” Badges are a new assessment tool that will help identify skills mastered in formal and informal settings, virtually and in physical spaces, in schools, workplaces and communities. They serve as virtual certificates. “To help advance and encourage this new use of technology, Mozilla is creating an Open Badge Infrastructure to make digital badges a coherent, portable and meaningful way to demonstrate capabilities. It will also encourage the creation of ‘digital backpacks’ of badges that people will carry to showcase the skills, knowledge and competencies they have gained.”

To view an archived video of this event, including Secretary Duncan’s remarks, please access the [event link](#). For more information about the competition, please access the [Badges for Lifelong Learning competition link](#). Please access [project collaborators](#) to view and learn about all of the organizations, corporations, government agencies and departments committed to this project.