

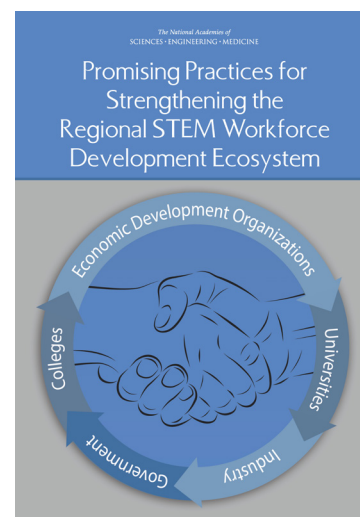
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Promising Practices for Strengthening the Regional STEM Workforce Development Ecosystem

The breadth and the depth of student experiences in STEM courses, labs, and applied learning activities ensures that they move into their careers with the skills necessary to help meet a region's STEM workforce needs. The most effective way to attain this outcome is for colleges and universities to work in collaboration with local businesses, industry and non-profit employers—with governments and third-party intermediaries such as local chambers of commerce also playing active roles.

These are the major messages of a new report by the National Academies of Sciences, Engineering, and Medicine, *Promising Practices for Strengthening the Regional STEM Workforce Development Ecosystem*. To collect and analyze evidence of promising practices, the committee that wrote the report held five regional workshops across the nation—in Phoenix, AZ; Cleveland, OH; Montgomery, AL; Los Angeles, CA; and Fargo, ND. Each workshop convened leaders and employers from the business community; administrators, faculty, and students from 2-year and 4-year colleges and universities; regional economic development experts; chambers of commerce; state and county policy makers; government officials; and philanthropic foundations. Three overarching findings emerged:

- Significant numbers of university students are graduating with STEM degrees, but many lack the right combination of technical and employability skills needed to thrive in the workplace. This situation is particularly acute with minority students and female students, who remain significantly underrepresented in the STEM workforce.
- Employers are increasingly focused on the skills and abilities new hires possess, rather than the specific field in which an individual has obtained a degree or credential. While there is a critical need for STEM graduates who will work as professionals, research and development scientists and engineers (using so-called STEM narrow skills), there is a growing need for individuals who have a facility with STEM concepts, but not necessarily a bachelor's degree (so-called STEM broad skills). There is also a growing need for students with broad skills outside of their core STEM discipline, including skills that are perhaps best developed through an education that includes humanities courses and experiences in the arts along with STEM courses. These skills include problem solving, critical thinking, teamwork and collaboration, communication, and creativity.
- A robust and effective STEM workforce development ecosystem requires proactive steps on behalf of university leaders, local employers, and intermediary organizations to build and sustain alliances that benefit students and regional economic development.



The report recommends concrete steps that various stakeholders can take to initiate and expand university-employer partnerships. For example:

- College and University Presidents should designate a high-level administrator or faculty member to serve as the initial point of contact with local businesses and give this individual the power and authority to enter into formal relationships with them.
- College and University Provosts and Deans should encourage the creation of STEM advisory board on campus—housed in various academic departments and coordinated by the individual with responsibility for serving as the point of contact for business—for the purpose of engaging the local employer community in discussions about workforce needs, collaboration, engagement, and mutual support.
- Faculty should recognize that the workplace is often characterized by challenging, multilayered problems that require teamwork and collaboration and good interpersonal relationships to identify possible solutions—and provide classroom and work-based experiences to all students that enable them to develop these problem-solving, critical thinking, and teamwork skills.
- Employers should make the development of work-based learning opportunities for students and faculty a priority—including paid internships, apprenticeships, and other experiences that provide hands-on, experiential learning at the worksite. They should also encourage their employees to serve as mentors to local college and university students, especially to underrepresented minority students and female students.
- Governors should pursue strategies to incentivize partnerships, collaboration, internships, and other activities that bring students and faculty into regular and sustained contact with local employers. They should also work with universities, employers and third-party intermediaries such as state workforce commissions and chambers of commerce to organize and facilitate a rigorous data analysis effort to understand the current and future workforce needs in the state and across its regions.
- Third-Party Intermediaries e.g., chambers of commerce, economic development organizations, and industry consortia) should facilitate the creation of effective workforce development partnerships among local employers and universities by bridging some of the cultural and communication barriers that can present obstacles to partnerships, helping employers and universities understand a region's competitive advantages by addressing data needs, and bringing promising partnership activities to scale.

COMMITTEE ON IMPROVING HIGHER EDUCATION'S RESPONSIVENESS TO STEM WORKFORCE NEEDS: IDENTIFYING ANALYTICAL TOOLS AND REGIONAL BEST PRACTICES

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For More Information . . . This Report Highlights was prepared by the Board on Higher Education and Workforce based on the report *Promising Practices for Strengthening the Regional STEM Workforce Development Ecosystem* (2016). The study was sponsored by the Leona M. and Harry B. Helmsley Charitable Trust. Any opinions, findings, conclusions, or recommendations expressed in the report are those of the authoring committee and do not necessarily reflect those of the sponsors. Copies of the report are available from the National Academies Press, (800) 624-6242; <http://www.nap.edu>.

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