

Ensuring the Needed S&T Workforce

The Role of State Government

Presentation at the CPST conference:
*Can We Compete? Trends in America's
Scientific and Technical Workforce*
Washington, DC: Nov 2, 2007

Governors & Tech-Based Economic Development (TBED)

- Governors concerned about how to compete with high-skill, low wage economies; believe that answer is by excelling at innovation and TBED
- Of 12 new governors elected in 2006, 8 talked TBED, compared to 8 of 20 in 2002 (SSTI)
- NGA Chair's Initiative under immediate past chair, Gov. Napolitano (AZ): *Innovation America*
- Drivers of TBED are: R&D, mechanisms for its commercialization, an entrepreneurial culture, risk capital, tech infrastructure and especially a skilled workforce, particularly in STEM areas

Fed Role in TBED

- Federal role is largely confined to funding basic research, though these investments fund much graduate education.
- Fed research \$ awarded on merit; don't take into account societal impact, alignment with industry
- Feds avoid industrial policy; promote economic development only in depressed areas and through such limited programs as MEP, TIP, SBIR and DOL's WIRED grants
- America Competes Act promises more for talent production, but authorizations vs appropriations

State Role: Increasing Investments in Targeted R&D and Commercialization

- AZ: Science Foundation Arizona - \$135M (match)
- CA: Institutes of Science & Innovation - \$400M (+Stem Cell)
- FL: Scripps Florida - \$310M
- MD: Stem Cell Research Fund - \$23M annually
- MI: 21st C Jobs Fund - \$2B over 10 yrs. for 4 R&D areas
- ND: Centers of Excellence – \$50M (private 2:1 match)
- OK: OK Center for S&T (esp. nano) - \$29M annually
- WA: Life Sciences Fund - \$350M over 10 yrs.
- Emphasis shifting from bio to clean energy
- Build expertise; encourage collaboration (across disciplines, between U. & industry, promote commercialization)
- More: see *Investing in Innovation*, NGA & PEW Center, 2007

State Role: Educating the Workforce

- States have major responsibility for K12 ed
- States are substantial funders and regulators of public higher education
- Governors deeply concerned about access, quality & costs, from early childhood ed to postsec production of adequate S&T workforce
- Thus, 2 of 3 focus areas in NGA's Innovation America initiative were improving K-12 STEM ed and better aligning postsec outputs (talent and R&D) with growth needs of regional economy

K-12 STEM Education I

- Initiative's STEM Education Goals:
 - All students graduate with STEM competencies needed by economy
 - More graduate prepared to pursue careers as STEM professionals
- Method; use state power to establish:
 - Rigorous, relevant standards aligned to the expectations of postsec education and the modern workplace
 - Statewide capacity for improving STEM teaching and learning to achieve these standards, with emphasis on content-rich teacher prep
 - New models and centers for supporting effective STEM teaching, classrooms, schools & districts
- Governors have the bully pulpit, convening authority, and funding levers to help create this new STEM education system; are doing so

STEM Education II

Examples of States Actions (NGA grant program -- \$500k to each of 6 states)

- CO creating regional STEM centers; main one to do analytical work, TA
- HI creating 2 STEM-focused schools, working on STEM assessment & teacher professional development
- MN creating math-focused professional development, 4 STEM academies
- OH creating STEM center in Dayton as pilot for centers across the state
- PA creating STEM center to oversee and coordinate 5 regional centers
- VA expanding its successful Governor's School model to create a series of career tech schools across the state
- Many other states have similar initiatives, including to develop data systems to track progress, to develop market & performance-based compensation packages for STEM teachers, and to stimulate student interest in STEM fields

Post-Secondary Education

- Initiative goals are to help states invest wisely in Univ.-based R&D and its commercialization (tech transfer, public spaces, angel networks, entrepreneurship ed, services – incubators/accelerators and research parks)
- Produce graduates with the skills needed, esp. in fields with shortages. PSM Programs are good example
- Begs questions about whether/why any shortages of STEM professionals: recruitment & retention issues. See Ron Hira's good points about a healthy system
- Govs want more re outcomes & accountability. See NGA report: *A Compact for Postsecondary Education*

PSM Degrees

- PSM is an innovative, new graduate degree designed to allow students to pursue advanced training in science or mathematics, while simultaneously developing workplace skills highly valued by employers. PSM programs consist of two years of academic training in an emerging or interdisciplinary area, along with a professional component that may include internships and "cross-training" in business and communications. All have been developed in concert with industry and are designed to dovetail into professional career opportunities. (sciencemasters.com)

PSM Programs

- Cheaper, faster, better (applied, industry involved)
- More students pursue, stay in region, meet industry needs
- Sloan seeded establishment of 100+ PSM programs at 50+ universities in 25 states
 - CA: CSU received a \$891,000 grant from the Sloan Foundation to launch 16 new PSM programs, in a variety of fields, on 12 of its 23 campuses in the next three years
- Yet need many more; only governments can take to scale?
 - NC: legislation funded study with tobacco settlement funds
 - NY: let's take a closer look

State Promotion of PSM Programs

- Gov. Spitzer created commission to make SUNY “an economic engine”
- Linked to PSM initiative, whose goals include:
 - Creating 2nd center of gravity in grad ed re distinctive purpose for master’s programs
 - Revitalizing career potential for students who do not wish to pursue the doctorate
- Elements
 - Creation of a 2-year PSM Director’s position in the System Provost’s office
- PSM Director’s Responsibilities
 - Consult and plan with SUNY faculty developing the programs
 - Work with the State Education Department to get the degree approved
 - Facilitate the development of appropriate industry partners in each region
 - Seek financial support from business and industry partners
- Anticipated Outcomes by 2010
 - 18-24 degree programs across 10-12 campuses

Role of NGA Center

- States could assess need and offer start-up grants on competitive basis.
- NGA Center for Best Practices is helping to engage/inform governors.
- Published Sloan-funded Issue Brief in 2006:
<http://www.nga.org/portal/site/nga/menuitem.9123e83a1f6786440ddcbeeb501010a0/?vgnnextoid=03dcc59ae624a010VgnVCM1000001a01010aRCRD>
- Planning Policy Academy in collaboration with NCSL and CGS, funded by Sloan Foundation.

Concluding Thoughts

- 3rd focus area? regional innovation system building (clusters, etc.). S&T talent critical but not sufficient (Russia). Need entrepreneurs and VC as well, collaboration among all these, infrastructure (broadband), attractive places to live, and conducive public policies
- Ensuring S&T workforce involves not just education but recruitment & retention, including relative attractiveness of S&T careers
- Even focusing on education: must we grow our own?
- In all of this, the feds and states have different roles. The feds invest in basic research; promise to do more concerning production of talent. But Feds eschew economic development except depressed areas
- States keenly interested in economic development, which regional in nature, and are best positioned to promote needed alignment of the various components of regional innovation systems
- A critical component is STEM workforce, and there is much states can do and are doing to strengthen it

Contact Information

Stephen Crawford, Ph.D., Director
Social Economic & Workforce Programs Division
National Governors Association
444 North Capitol Street (Suite 267)
Washington, DC 20001
202-6224-5394; scrawford@nga.org
www.nga.org