

**PA House of Representatives Education Committee Testimony**

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**PA Industry and Business Impact of Continued Poor Math/Science Achievement,  
particularly in recruiting from disadvantaged communities**

Chairman Roebuck, Chairman Clymer and members of the Education Committee, I am grateful for this opportunity to submit testimony to the committee on an issue of vital importance to our region's, state's and nation's competitiveness—STEM (Science, Technology, Engineering, & Math) Education.

The DVIRC is a private non-profit 501(c)(3) regional economic development organization serving the five county region of Southeastern Pennsylvania. As part of the statewide Industrial Resource Center and the national Manufacturing Extension Partnership networks, the DVIRC is nationally recognized as one of the leading centers in the country that helps manufacturers grow business value through one-on-one consulting, talent development and corporate finance/growth capital. Our vision is to see the Philadelphia region become an internationally recognized leader in manufacturing competitiveness. DVIRC has been operating successfully since 1988 and has worked with over 1,500 companies employing thousands of employees in the region.

DVIRC's Board of Directors has been instrumental in developing strategies for STEM as it relates to manufacturers, has long supported our work on the regional Applied Engineering Technology<sup>1</sup> program, and has guided our collaborative efforts on the Regional Compact for STEM Education.<sup>2</sup>

My testimony will include brief comments within the following categories:

- The Impact of Poor Math & Science Achievement on Business
- Notes on the Region's Manufacturing Sector
- The Regional Compact for STEM Education and the PA STEM Initiative
- Suggestions for Consideration

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<sup>1</sup> See <http://www.dccc.edu/aet222/>

<sup>2</sup> See <http://www.dvirc.org/index.php/t4/192/>

## **The Impact of Poor Math & Science Achievement on Business**

Businesses are constantly dealing with the increased costs of hiring, the increased costs of training, the increased costs of ‘poaching’, and relentless price pressures driven by an international marketplace. From a human resources perspective here is what businesses want:

- More technically sophisticated talent with higher levels of math and science proficiency
- People that are versatile, agile, cross-trained, and flexible
- People that can work in teams and solve problems creatively
- Skilled, well-educated technicians, scientists, and engineers (which will be in greater demand and short supply over the next several years), and
- Individual associates that show respect for and appreciate human diversity

Poor math and science achievement obviously has a direct impact on the size and composition of the pool of qualified or credentialed candidates from which companies hire. Most businesses appreciate the need for diversity in the workplace but are challenged by their diversity goals (as are engineering schools) because too few qualified applicants are women and too few are people of color. And too few are qualified because they haven’t enrolled in or completed the STEM-related academic programs that make them valuable to the marketplace.

The DVIRC has spent the last decade working with high schools, community colleges and four-year institutions in various capacities around workforce issues. Of particular note is our work with Delaware County Community College on the development of an Applied Engineering Technology education program<sup>3</sup>, which many minorities have successfully completed, leading to employment in area companies such as Sunoco, Penn Machine, Synthes, Southco, and many others.

The marketplace’s need for technically proficient, STEM literate individuals will only increase over time, and I submit that our challenge is to make sure that **all** of our students have the foundational math and science education they need to pursue the higher education they need to have a value proposition for an employer.

The demographic facts are unassailable: the workforce is aging and minority populations are growing so our region’s population will be increasingly older and more diverse. While recent economic calamities may have decelerated the rate of retirements, they will soon be a major factor in our labor market. And while we have seen modest gains in educational performance among some of our region’s high needs districts and among underrepresented populations, those gains do little to help with the increasing demand for individuals with STEM education. In short, our regional labor market will need all of its citizens to participate in an increasingly sophisticated and STEM-based labor market.

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<sup>3</sup> See <http://www.dccc.edu/aet222/>

## Notes on the Region's Manufacturing Sector

Manufacturing in the Greater Philadelphia region is nearing the end of a 30-year transition...but our 5-county region still has some 4,800 manufacturing companies that make things and that employ some 160,000 people.

The region's manufacturing sector has been transformed over the past several decades. Interestingly, while it has shed over 150,000 jobs it has also increased its gross regional output while outpacing the nation in productivity. This is due in large part to more sophisticated management practices and investments in technology, both of which require a new kind of person with a new set of skills.

Regional manufacturing output was over \$23 billion in 2003.<sup>4</sup> Growth continues, not based on volume production but on a higher value-added "making of things" that requires a higher level of education. **Few high school graduates can now walk into a job at a modern manufacturing company without some prior specialized education or training.**

I have witnessed the regional rise and demise of a company like semiconductor leader *Kulicke and Soffa*; have personally helped to shut down the *Exide* battery plant in North Philadelphia; have watched the transformation of the Rohm & Haas facility in Bristol and the steel plant in Fairless Hills; have watched the disappearance of automotive supplier and family employer *The Budd Company*; have watched the dismantling of the *Philadelphia Navy Yard* (which once employed 60,000 people); and have watched the disappearance of countless other firms whose hulking industrial skeletons litter the Amtrak and 95 corridors like the gravestones of a bygone era.

**The commodity production associated with this history is not coming back and manufacturing is no longer the sector that can employ the uneducated or under-educated.**

The opportunities within this sector, however, will still be significant, particularly since manufacturing jobs on average pay 25% better than jobs in other sectors. Opportunities abound, but a higher level of educational attainment with a stronger focus on science and math education will be required before individuals can seize these opportunities. And although we no longer produce trousers for the world, we do have strengths that will thrive in the 21st Century, such as:

- Pharmaceutical/Bio/Life Sciences
- Chemical and Food Processing
- Metalworking & Machining
- Machinery and Equipment
- Transportation: Rotorcraft, Rail Cars, Shipbuilding
- Defense / Aerospace
- Medical Devices & Packaging
- Energy and Others

All of these sectors will require researchers, engineers, and technicians. All will require STEM.

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<sup>4</sup> *Manufacturing Pennsylvania's Future*, Deloitte Consulting, 2004, p. 115. This number included 4 NJ counties.

[Select Greater Philadelphia](#) works feverishly to attract businesses to our region to create jobs and foster economic growth. They are engaged with a multi-million dollar industry called Site Selection, where private companies hire professionals to help them find the best place to start or expand their business. Site Selectors are concerned with many things, but over the past several years their priorities have shifted from a focus on state incentive packages, wage rates, energy costs, tax structures, transportation infrastructure, market access, and building costs to questions about a company's ability to find and hire the people it needs to grow. Site Selectors used to want to talk to other CEOs; now they want to talk to HR managers.

Simply having a wealth of academic institutions in a region (as Greater Philadelphia does) used to be enough. In today's world companies are taking a much closer look to see how hard it is to find and keep a well educated EMT, a lab technician, or a CNC machinist.

It is not news that most of today's jobs and more of tomorrow's will increasingly require STEM-related education. It is not news that high needs districts continue to struggle with educational performance. It is not news that fewer individuals, particularly historically under-represented populations, are pursuing STEM education. It is not news that all citizens need STEM education. Consider the following quote from Battelle Memorial Institute:

STEM skills are not just important for people who want to pursue a career in research or technology, or only for those who are "good at" math and science. STEM skills underpin the intellectual vibrancy of a society. STEM builds critical thinking & the ability to address complex problems, and it cannot be an option for only a select few.<sup>5</sup>

What is news is that there are now platforms upon which to organize the diffuse and disconnected activities within and among the many institutions, organizations, and businesses that want to help so that we can improve math and science achievement across the board.

These platforms are the Regional Compact for STEM Education and the PA STEM Initiative.

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<sup>5</sup> See <http://www.battelle.org/community/Education/index.aspx>

## **The Regional Compact for STEM Education and the PA STEM Initiative**

The Regional Compact was a direct outcome of *The Regional Talent Development Forum: A Dialogue for Action* held in the summer of 2006 by DVIRC in partnership with the National Council for Advanced Manufacturing, the Pennsylvania Department of Community and Economic Development, the University of Pennsylvania, the Math Science Partnership of Greater Philadelphia, Select Greater Philadelphia, Ben Franklin Technology Partners, WHYY, The Philadelphia Education Fund, Rohm & Haas, and numerous other partners.

The **vision of the Compact** is “to empower the region’s capacity to develop a talented, robust and eclectic science, technology, engineering and mathematics (STEM) oriented workforce, capable of performing, adapting and thriving in a dynamic knowledge-driven economy.” As of this writing, an eclectic group of 76 institutions and organizations have signed on. I am providing electronic copies of the Compact and the signatories as part of this testimony.

Regional Compact partners have been working with the Team PA Foundation and the commonwealth on the **Governor’s PA STEM Initiative**, funded by the National Governors Association (NGA) Center for Best Practices. We are now nearing the end of a planning cycle that will produce the following documents for the NGA, and create a roadmap for the five regional STEM networks established throughout Pennsylvania:

- Long-term goals and a strategy for achieving them
- A Gap Analysis
- An Asset Mapping Plan
- A Communications Plan
- A Resource Development Plan

The PA STEM Initiative is committed to being data- and performance driven and has developed the following long-term goals:

1. Increase the number and diversity of Pennsylvania’s students, residents and workers with high quality post-secondary STEM education and training.
2. Ensure that all graduates from Pennsylvania’s high schools meet or exceed proficiency in STEM content areas.
3. Diversify and increase the number of Pennsylvania teachers who are well prepared and highly-effective in providing STEM education.
4. Increase awareness of and commitment to STEM education as a priority for Pennsylvania.

Regional partners here and around the state are committed to maintaining alignment of regional activity with the commonwealth’s efforts and to supporting the many existing and emerging efforts around STEM education. I wish to acknowledge the Governor’s Office for its direct involvement in this project and to note the unprecedented level of inter-departmental cooperation among Education, Labor & Industry, Community & Economic Development, and Environmental Protection.

## Suggestions for Consideration

Chairman Roebuck, Chairman Clymer and committee members, I offer the following suggestions as a way to advance the dialogue around your extremely important work and to set the stage for the next phase of action for Pennsylvania's STEM Networks.

- Review the PA STEM Initiative, and regional plans to help determine the level of support needed to sustain the five regional STEM networks and to implement robust asset mapping activities, data collection, and communications plans
- Support work for a **systems approach** to understanding how the education, economic development, workforce development, and business systems can work more efficiently and effectively
- Implement **recommendations from the Commission on College and Career Success**<sup>6</sup> with a focus on STEM. Of particular note for this topic are recommendations 7 and 11:
  - *Recommendation 7*—Identify early on those students in danger of falling behind in their achievement of academic standards. Provide additional instruction and support services to put those students back on track for success. This early warning system should begin no later than the sixth grade.
  - *Recommendation 11*—Facilitate the coordination of existing, and the development of new, programs designed to encourage economically and educationally disadvantaged students to attend, be retained and complete their postsecondary education programs
- Double the number of STEM-based **internships and externships** for students and teachers
- Make it a priority to **know what works** where and why and then develop a business-like way to take what works (as appropriate) to scale.
- Celebrate success: highlight the achievement of schools, teachers, administrators, and individuals to include in any communications plan
- Seek and support bold and transformational solutions and innovations
- Support the ongoing development of social capital around STEM education
- Transform the physical place where our students learn so that they want to go there every day

Thank you for this opportunity and for the hard work of the committee on this highly charged and very important issue.

Please include the following attachments as part of the record:

- The [Regional Compact for STEM Education](#)
- [List of Signers to the Regional Compact](#)

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<sup>6</sup> See [http://www.pde.state.pa.us/stateboard\\_ed/cwp/view.asp?a=3&q=126857](http://www.pde.state.pa.us/stateboard_ed/cwp/view.asp?a=3&q=126857)