



Commentary

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Looking Back: A Nation at Risk and National Standards

Many educators have heard of the document *A Nation at Risk* (NCEE 1983), but do you remember what the United States was a nation at risk of? The focus of the risk was not primarily on schools—it was on the economy. In 1983 when the National Commission on Excellence in Education (NCEE) document was published, the United States was proclaimed a nation at risk of losing its place in the global economy.

A Nation at Risk is almost eerily prophetic. Consider the following from the beginning pages of the document: “Our nation is at risk. Our once unchallenged preeminence in commerce, industry, science, and technological innovation is being overtaken by competitors throughout the world...We live among determined, well-educated, and strongly motivated competitors. We compete with them for international standing and markets...America’s position in the world may once have been reasonably secure with only a few exceptionally well-trained men and women. It is no longer” (NCEE 1983).

The members of the NCEE who wrote *A Nation at Risk* pretty much looked into the future and saw today’s modern economy where low-skilled jobs are being outsourced off American soil. The NCEE predicted today’s reality where American workers have to be smarter and work harder just to maintain their quality of life.

The standards movement in America, which followed on the heels of *A Nation at Risk*, read to me like a solution manual to the economic problems posed in the NCEE document. America lacks a workforce ready for the global economy, and inquiry in the science classroom answers that need. This case was laid out in the *National Science Education Standards* (NRC 1996). The developers of the Standards clearly saw the link between science learning and workforce development: “Science understanding and ability also will enhance the capability of all students to hold meaningful and productive jobs in the future. The business community needs entry-level workers with the ability to learn, reason, think creatively, make decisions, and solve problems” (p. 12). You are probably familiar with how the Standards advocated for inquiry as central to science learning. Students who can do inquiry’s intellectual work will be prepared for the mental challenges of today’s modern workforce.

Looking around: The gathering storm

In 2000, a national commission led by astronaut John Glenn (NCMST 2000) reported their findings. In many

ways, the Glenn commission picked up right where *A Nation at Risk* left off, making three points about the link between America’s economy and the science (and math) education our children are receiving:

- ◆ “The future well-being of our nation and people depends not just on how well we educate our children generally, but on how well we educate them in mathematics and science specifically” (p. 6).
- ◆ “Our children are falling behind; they are simply not ‘world-class learners’ when it comes to mathematics and science” (p. 6).
- ◆ “The most powerful instrument for change...lies at the very core of education—with teaching itself” (p. 7).

The Glenn commission fleshed out the picture of the fundamental ways the American economy is changing:

- ◆ The new economy is rich in technology and technology innovation; science and math education are the best preparation for these changes.
- ◆ The number of high-tech jobs will increase dramatically; without strong science and math education, American students will be unprepared to take these jobs.
- ◆ The new global economy allows much easier relocation of jobs around the world; if American students are not prepared to fill jobs on American soil, global economic pressures will force business and industry to relocate those jobs to countries that have a workforce ready to fill those jobs.

In light of these dramatic changes, the Glenn commission pointed right to the heart of the classroom, singling out teaching as the essential component that needs to change to improve student learning. The Glenn commission first raised serious concerns about how America’s science teaching remains starkly traditional: “Despite the dramatic transformations throughout our society over the last half-century, teaching methods in mathematics and science classes have remained virtually unchanged... Most science students spend much of their time learning definitions, or the labels that apply to natural phenomena and scientific processes...It is hard to imagine that

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students in these classes are gaining the conceptual and problem-solving skills they need to function effectively as workers and citizens in today's world" (p. 22–23).

As the Glenn commission ended their report, they called for major changes in teaching itself, many of which relate directly to inquiry: "The process of inquiry, not merely 'giving instruction,' is the very heart of what teachers do...It uses 'hands on' approaches to learning, in which students participate in activities, exercises, and real-life situations to both learn and apply lesson content. It teaches students not only what to learn but how to learn" (p. 22).

In 2006, another national report added to and deepened the findings of the Glenn commission. *Rising Above the Gathering Storm* (CPGE 2006) was produced by a committee formed by the National Academy of Sciences, the National Academy of Engineering, and the (national) Institute of Medicine. The research of the Committee on Prospering in the Global Economy of the 21st Century (CPGE) led to the same conclusions as those of *A Nation at Risk* and the Glenn commission: "Having reviewed trends in the United States and abroad, the committee is deeply concerned that the scientific and technological building blocks critical to our economic leadership are eroding at a time when many other nations are gathering strength" (p. 4). This competition in a global, knowledge-based, high-tech economy is the gathering storm of the report's title.

Regarding teaching, the CPGE focused one of its four recommendations on America's science and math classrooms, setting as a goal to "increase America's talent pool by vastly improving K–12 science and mathematics education" (p. 112). As had been done previously, the CPGE tied their proposition intrinsically to the health of America's economy: "The U.S. system of public education must lay the foundation for developing a workforce that is literate in mathematics and science, among other subjects. It is the creative intellectual energy of our workforce that will drive successful innovation and create jobs for all citizens" (p. 112). Also as had been mentioned before, the CPGE pointed to the need for inquiry-based science teaching as the type of deep learning American students need.

Looking ahead: Our students' future

Looking back, we were a nation at risk in the early 1980s, and, looking around, we still are. Now, as we look ahead, we can probably all agree that a lot of change is in our future. As the pace of global change and technological

innovation increase, preparing our students for their adult lives is like hitting a moving target. We are not sure what is coming, and this is yet another reason to shift science teaching to inquiry. Inquiry prepares students with the tough mental habits of mind they need to change and adapt to the world that stretches out before them in the decades of this century.

Consider the link between the knowledge and skills learned in an inquiry classroom with those needed in today's workforce. (**Note:** For a figure describing more about this link, visit www.nsta.org/highschool/connections.aspx.) Students in an inquiry classroom manage information and data and work with technology, as they will throughout their careers in an economy of knowledge work. In inquiry, students collaborate to solve problems, mirroring a major element of work in today's fiercely competitive global economy. Students have to think for themselves to succeed in an inquiry classroom, and years of inquiry add up to strong minds capable of critical thinking and creative problem solving. With these strong minds, students can adapt to the future ahead of them, both as workers and as caring, thoughtful adults in the rest of their lives.

Inquiry is a paradigm shift that science teachers need to make because it is essential preparation for our students. Their future jobs depend on it. Our current and future economy depends on it as we face a rising storm of global competition.

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