Seeking Science Standards

GREAT CONCERN HAS BEEN VOICED FOR AT LEAST 30 YEARS ABOUT THE SAD STATE OF U.S. PRIMARY AND SECONDARY EDUCATION IN MATHEMATICS, SCIENCE, ENGINEERING, AND TECHNOLOGY, BUT LITTLE REAL PROGRESS HAS BEEN MADE. THE MOST RECENT FINDINGS FROM THE U.S. DEPARTMENT OF EDUCATION BROUGHT NO OPTIMISM. IN 2005, 32% OF ALL U.S. FOURTH-GRADERS AND 41% OF EIGHTH-GRADERS SCORED BELOW EXPECTED ACHIEVEMENT LEVELS IN SCIENCE. NEARLY 30% OF ENTERING COLLEGE STUDENTS NEEDED REMEDIAL SCIENCE AND MATH COURSES. HOWEVER, WE ARE AT A MOMENT IN U.S. HISTORY TO FINALLY ADDRESS ONE CAUSE OF THE PROBLEMS, AND THE SCIENTIFIC COMMUNITY NEEDS TO HELP CAPTURE THIS UNIQUE OPPORTUNITY.

THE MANY NATIONAL COMMISSIONS AND STUDIES OF SCIENCE EDUCATION IN THE PAST THREE DECADES HAVE CONSISTENTLY IDENTIFIED THE SAME TWO ISSUES AND POTENTIAL REMEDIES: A NEED FOR MUCH BETTER-PREPARED MATH AND SCIENCE TEACHERS AND FOR A CLEAR STATEMENT OF LEARNING GOALS FOR SCIENCE THAT ARE THE SAME ACROSS THE UNITED STATES. THE CONSISTENCY WOULD REMOVE SOME OF THE DISADVANTAGES FACED BY STUDENTS IN STATES WITH LESS RIGOROUS STANDARDS, AND IT WOULD EASE STUDENTS’ MOBILITY ACROSS STATE BOUNDARIES. IT WOULD ALSO HELP THE UNITED STATES DEVELOP ROBUST CURRICULUM AND ASSESSMENT MATERIALS AND PREPARE TEACHERS WHO UNDERSTAND THE SCIENCE TO USE SUCH TOOLS TO HELP STUDENTS REACH THE STANDARDS. NEARLY ALL OF AMERICA’S COMPETITOR COUNTRIES HAVE NATIONAL SCIENCE EDUCATION STANDARDS AND SCORE MUCH HIGHER ON INTERNATIONAL SCIENCE ACHIEVEMENT ASSESSMENTS: U.S. 15-YEAR-OLDS RANKED 21ST AMONG STUDENTS IN 30 DEVELOPED NATIONS IN SCIENCE ON THE 2006 PROGRAMME FOR INTERNATIONAL STUDENT ASSESSMENT.

Efforts are now under way that can move the United States toward what are often referred to as “common, internationally benchmarked, state-approved standards.” In March 2010, the National Governors Association and the Council of Chief State School Officers (CSSO) released a draft of Common Core State Standards for English-language arts and for mathematics. This was followed in April by a call for state assessment systems based on those common standards. Because education in the United States is the responsibility of individual states, with the federal government providing vision and support but not control, this historic call by state leadership for common standards and assessments is momentous indeed. But science education has been left out of this public agenda for standards development. Fortunately, there is a major privately funded, common science education standards development effort taking place. The Carnegie Corporation of New York has funded the U.S. National Academy of Sciences (NAS) to develop a framework for such standards, and then, through work with the educational nonprofit organization Achieve, the standards themselves. The American Association for the Advancement of Science (AAAS) will play a supporting role in both efforts.

But the private effort to develop common standards can only be effective if the scientific community mobilizes to support it. This help is needed in at least three major ways. State and local education leaders need to hear now from the scientific community about the need for a common and coherent set of science education standards. Such urgings should be directed at state and local school boards, CSSOs, and state legislators who may ultimately rule on the use of these standards. Scientists must also participate in the standards development process. The first broad call for their contribution will come from NAS and is expected this summer, when comments will be sought on a draft framework. Once states agree on common science standards, scientists should help schools and teachers implement them, as many educators will have to learn new content, and they will need the help of scientists to support student learning.

A unique time has arrived for achieving the long-needed goal of common, state-level science education standards in the United States, a core component of effective science education reform. But we can only capture this opportunity if the scientific community steps up as a vocal, energetic advocate for common standards, while also becoming an active partner in the development and implementation processes.

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Editor's Summary

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