STATEMENT FOR THE RECORD

on behalf of

THE NATIONAL SCHOOL BOARDS ASSOCIATION

on

NATIONAL SCIENCE BOARD'S ACTION PLAN FOR STEM EDUCATION

before the

House Subcommittee on Research and Science Education of the
Committee on Science and Technology
October 10, 2007

by
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Chairman Baird, Ranking Member Ehlers, and Members of the Subcommittee, thank you for the opportunity to testify on the National Science Board's (NSB's) proposal to improve STEM education.

My name is Chrisanne Gayl. I am the Director, Federal Programs at the National School Boards Association. Our association represents the nation's 95,000 local school board members.

Big Picture

First, let me express our appreciation for the committee's leadership in this area. Science Technology Engineering and Math (STEM) education is an important part of the education and skills that students need to become productive adults and to compete successfully in the 21st century workforce.

As you know, the Bureau of Labor Statistics has estimated that the U.S. economy will add 1.5 million scientists, engineers, mathematicians, and technicians (of varying levels) between 2004 and 2014.[1] We must keep in mind, however that while jobs in the STEM fields are growing, they still comprise a small percentage of the 18.9 million jobs that are forecasted to be created in the U.S. economy.[2]

Nevertheless, as our world becomes more globally competitive, knowledge-based, and technologically driven, the need for students to develop STEM literacy has become more important. Evidence suggests that businesses of all types are encountering a need for employees with higher-level skills, regardless of the path that they choose after graduation.[3]

Furthermore, as individuals and as citizens, we are faced with decisions every day that demand high levels of understanding and judgment. A trip to the doctor, for example, often requires an understanding of statistics and analytical ability so we can compare the relative merits of particular treatments. As voters, we are called upon to make choices about issues regarding science such as global warming and stem-cell research.[4]

While the reality is that not all students—not even the majority of students—will go into STEM-specific jobs, the need for basic STEM literacy has become necessary in order to be productive workers, good citizens, and intelligent consumers. As responsible stewards of our children's future, our education system should be designed to provide students with the high-level skills they will need if they choose to pursue STEM-specific career paths, as well as adapt to the changes that our society demands in order to remain effective and relevant in the 21st century.

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[1] BLS, Occupational employment projections to 2014; *Monthly Labor Review*, November 2005.
[2] Ibid.
[3] ACT, Inc., *Ready for college or ready for work: Same or different?* 2006.
[4] Barth, Patte, "A Common Core Curriculum for the New Century," *Thinking K-16*, Vol. 7, Issue 1, Winter 2003.

Throughout the country local school boards have been working to strengthen STEM education in a number of ways—through the integration of new technologies into the classroom, especially in subjects such as math and science where these tools are core to their real world application and simulation, offering more online learning opportunities, and increasing math and science course requirements.

Many school districts have also increased their offering of rigorous Advanced Placement (AP) courses. Research has shown that students who take AP courses are more competitive with their international peers on international assessments, and are more likely to pursue higher education degrees in science, technology, engineering and math.[5]

Congress can help to foster these educational successes by demonstrating greater leadership at the federal level. The National Science Board's Action Plan offers some useful suggestions of ways that the federal government can elevate the importance of STEM education and enable opportunities that will enrich teaching and learning in these fields. As an example, the federal government is in the unique position to assemble the profound knowledge base that exists within these disciplines and to disseminate information on effective tools, models, and practices that will strengthen STEM education. Additionally, Congress can provide valuable incentives to improve teacher quality and spur local investment in this area.

If I leave the committee with just one overall impression today I hope it is this: We believe that this action plan is a step in the right direction for promoting high-quality STEM education in the U.S. Its emphasis on increasing public appreciation for and understanding of STEM education is consistent with the key work of local school boards to engage their communities and ensure support for these initiatives. In particular, the plan's focus on ensuring an adequate supply of well-prepared and effective STEM teachers is absolutely essential to enhancing student learning in these fields.

However, we caution the Committee against some of the recommendations in this plan that could ultimately erode state and local control over education, which is the foundation of our education system and critical to public support for any initiative. The top-down approach of creating a national council to set academic content guidelines and teacher certification requirements is troublesome for school board members who value local flexibility and must deal with the day-to-day operational challenges of implementing these policies.

Furthermore, let me say that while the report addresses many important areas, it does not mention one significant need, the provision of up-to-date laboratory equipment and modern classrooms, which are necessary to successfully implement a relevant STEM program. Such facilities are essential for students to be able to experiment, create, and get a hands-on feeling for what the world of work is like in these fields. This scale of modernization will require a large infusion of capital and clear design guidelines if

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[5] College Board, *Advanced Placement: Report to the Nation 2007*. http://www.collegeboard.com/prod_downloads/about/news_info/ap/2007/2007_ap-report-nation.pdf

America's STEM classrooms are to be appropriately outfitted for the type of instruction that is envisioned in this report. Failure to provide the adequate resources to create appropriate classrooms for STEM teaching will negate the efforts to implement high-quality standards and provide well-prepared teachers.

In the remainder of my testimony, I would like to highlight a few of the key recommendations contained in the Action Plan, which are of particular interest to local school boards.

Qualified Teachers

NSBA strongly supports the focus on "developing human capital" in this plan to meet the need for an abundant supply of well-prepared teachers in STEM fields, a *sine qua non* in improving our education system.

As the report rightly notes, local school systems encounter many barriers to recruiting and retaining high-quality STEM teachers. The clear link between teacher quality and student achievement, coupled with estimates that 2 million new teachers will be needed in the next decade to address retirements and turnover, argues for a sustained commitment and partnership among all levels of government to build and maintain the teaching force needed to make a positive difference for America's students.

NSBA supports an array of incentives, many of which are mentioned in this report, to recruit and retain teachers in high-need STEM subjects and other areas, including performance-based pay, bonuses, alternative certification programs, and student loan forgiveness. NSBA believes that the best approach to increase teacher quality is to leverage the resources of the federal government to encourage the creation and expansion of a range of strategies, many of which states and school districts already are implementing.

In addition, NSBA agrees that Congress should help strengthen teacher preparation programs within universities to ensure appropriate alignment with academic standards and foster greater accountability among these programs. Clearly, we must ensure that teachers have the content knowledge that their students will be expected to know. We would suggest, however, that teacher preparation programs be aligned with existing state academic standards, which all states are required to have in place under No Child Left Behind, as opposed to "national content guidelines" that would be developed by an independent STEM education council.

Given that the majority of tomorrow's teachers are already in today's classrooms, we also believe that more attention should be given to developing and bringing-to-scale high-quality professional development programs for existing teachers. These programs can play an important role in updating teachers' knowledge and skills in their subject area and have been shown to have a positive impact on teacher retention.

National STEM Council

NSBA believes that the creation of a STEM education council could be helpful in coordinating various STEM programs and initiatives throughout the federal government, disseminating best practices, and developing tools and resources that educators can use in the field. However, as drafted, NSB's plan calls for the creation of an independent, non-Federal National Council that would have significant powers beyond these tasks and considerable influence over the direction of our nation's education policy.

For example, the council would: coordinate the development of national standards for STEM teacher certification, coordinate and assist with the development of national STEM content guidelines, and help states establish and strengthen P-16 councils.

NSBA believes that giving such responsibilities to an independent national council is in direct conflict with our locally and democratically-controlled public education system. Such an entity would divest state and local governments of their responsibilities and authority over public education, and institute a governance structure with little or no oversight or accountability that would be responsible for high-level decision-making.

Although the Board acknowledges in their plan that local and state governments "bear the ultimate responsibility in the Nation's system of public education," there seems to be a fundamental mismatch between what the plan says about the responsibilities of local government and what it is proposing in terms of the overall scope and mission of the council. It is worth noting that there are no permanent seats on the council to be filled by local school board members who are local governing officials. Yet, this entity would have significant responsibilities to coordinate among federal, state, and local governments and impose its recommendations on such groups.

National Content Guidelines

As noted, one of the council's responsibilities would be to "coordinate and assist with the development of national STEM content guidelines for pre-K-12." NSBA believes that the dissemination of content guidelines may be helpful in enriching math and science curriculum and setting clear learning expectations for students, however, we caution that it is a slippery slope from content guidelines to national standards.

The Board's recommendation to align these newly developed content guidelines with metrics, including the National Assessment of Education Progress (NAEP) tests and NCLB-related assessments, would create a situation in which these guidelines really aren't voluntary since all states are required to participate in NAEP and to administer math and science assessments for particular grades under No Child Left Behind. As a result, we believe it is absolutely critical for this plan to emphasize that these guidelines should allow flexibility for local and state education agencies to choose curricula and design standards that best meet their needs.

As the Board notes in its plan, considerable work has already been done by a number of groups including the National Council of Teachers of Mathematics, the National Science

Teachers Association, and the Association for the Advancement of Science through its Project 2061, to develop content guidelines or voluntary standards in various disciplines. Therefore, we need not reinvent the wheel. However, consideration should be given as to how such work fits within the larger context of ensuring that students are college and workforce-ready.

Conclusion

In conclusion, I would like to say that the National Science Board's Action Plan is an important contribution to the national dialogue on STEM education. Greater federal leadership is needed in this area if we are to meet the challenges of the future. The National School Boards Association embraces the plan's priority goals—to ensure greater coherence in the STEM education and to ensure that students are taught by well-qualified, highly-effective teachers. However, we remind the Committee that such policy goals must be workable and practical at the local level in order for them to succeed. Congress can help to make this happen by providing school districts with the models, tools, incentives, and resources they need to improve STEM education in their communities.

I thank the Committee for this opportunity to testify here today. Local school board members are encouraged by the attention that this committee has given to improving STEM education in the U.S. and the work that it has done to help ensure our children will be able to compete effectively in global economy. We look forward to continuing to working with you on this important issue.

Chrisanne Gayl joined NSBA in 2005 as Director, Federal Programs where she is responsible for developing and implementing legislative strategies to advance the federal policy interests of local school boards. Her work focuses on a variety of issue areas including education technology, workforce competitiveness, school health, and early childhood education. Before joining NSBA, Chrisanne was the Policy Director at the Workforce Alliance where she oversaw the organization's direct and grassroots advocacy on federal legislation and national funding initiatives related to workforce education and training. She also served as the Federal Representative for former California Governor Gray Davis, representing the Governor in Washington, DC on federal education policy, as well other social issues. Chrisanne holds a Master's degree in Public Policy from Georgetown University's Public Policy Institute and received her undergraduate degree from Colby College in Waterville, Maine.

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