

**Testimony
Hearing on STEM Education
Los Angeles Unified School District
September 21, 2007**

Todd Ullah Ed.D

Director of Secondary Science Education

**Project Director for Los Angeles California Mathematics and Partnership Grant
Project Director for the NSF Los Angeles Urban Systemic Program
Co-PI for the US Department of Education Quality Educator Development Grant**

I welcome the opportunity to be here today on behalf of our Superintendent of Schools David L. Brewer III and our Chief Instructional Office for Secondary Education Mr. Robert Collins and the over 750,000 kids engaged in science and mathematics education each day in our district. This Committee's work is of vital interest to the children and families of urban and rural schools throughout the nation. It is our belief that STEM education is critical to the national security and economic prosperity of the nation here in the 21st century. Science and technology will be a vital part of every job and occupation in this century for jobs that exist and those that will be new to us in the future. The children occupying seats in the nation largest cities and schools need access and equality of opportunity regarding education in general and STEM education in particular. Public education must succeed in providing a rigorous, culturally relevant, comprehensive, standards based education for all students in our schools. I would also emphasize this point by indicating that we must close the achievement gap by providing sound instructional support and culturally relevant strategies to the nation's science and mathematic teachers in explicit ways to help them provide this rigorous and relevant education for learners we find in our schools today. Our district is reaching out to make this happen every day in our schools through our five guiding principles (decision-making based on data, research and analysis; professional development for all employees; promoting innovation and change within the District; engaging parents and partnering with the community; and ensuring the physical and emotional safety of students on campus) and a theory of action of standards-based instructional guides, diagnostic periodic assessments, and intensive ongoing professional development for math and

science teachers. In this quest, we focus on building leadership capacity in science and math vertically within schools and horizontally among schools. We fully believe that developing leadership with a consistent direction within a constantly changing educational landscape is important. So we focus our efforts on equity and access and instruction in our schools. This we believe will help our district go to scale in implementing incremental but sustained changes in teacher practices. We believe that in order for the California districts to improve public instruction and heed the recommendations and alarms of previous reports by this committee and other eminent bodies worldwide a series of key supports and risks must take place in the nation:

1. Focus on Instruction;

- Make science an assessment component of the No Child Left Behind Adequate Yearly Progress for schools and districts to bulk up the accountability to measure science progress in our schools
- Challenge students with high expectations and give them the support to reach their potentials.
- Teach and support science at the elementary level a key to literacy and numeracy.
- Make abstract concepts in science and instruction concrete by showing teachers, administrators, and the public what it looks like in practice.
- Provide content and pedagogical professional development that focuses on inquiry based standards driven instruction that honored student prior cultural knowledge and patterns of home discourse based on language and other factors.
- Continue to use system wide as well as classroom based diagnostic periodic assessments and aim intervention at grade/credit recovery and algebra readiness. Point classroom extensions toward apprenticeship experience and connect abstract concepts in science to real world experiences and realia student are familiar with and that are engaging while strongly tied to schooling.
- Take responsibility for the public infrastructure (science facilities, professional development centers, intervention programs) that will sustain the kind of support necessary to assure that schools have access to curriculum and professional development;
- Coordinate lesson plans and instructional unit across schools and grades.
- Fund parent participation at all grade levels with innovative programs.

2. Attend to recruitment, retention, and the moral of new and experienced teachers;

- Develop and support Legislation that consistently and coherently support science teacher professional development similar to the State Reading and Mathematics initiatives. As an example, Senate Bill 960 by Senator Elaine Alquist (D-Santa Clara) has been proposed to add science to the existing high-quality professional development program for reading and math. The bill also requires the State Superintendent to convene an advisory committee to ensure the quality and effectiveness of the science professional development training. We urge the committee to support such legislation.
- Development of policies and procedures that support physical infrastructure that support rigorous, inquiry driven, standards based instruction. The number one reason science teachers leave before 5 years is inadequate science laboratories and tools.
- Resolve the complex and often challenging credential requirements as part of the highly qualified teacher component of No Child Left Behind
- Treat teachers as the trained professional educational leaders they are and seek input and collaboration on designing curriculum and pay them well. Remove the legacy culture that regards teaching as low-skill work, of a profession that has failed to develop a practice and to control entry based on the mastery of that practice.
- Focus on building leadership structures and internship opportunities that build capacity through collaboration and revitalization.
- Create greater awareness of teaching mathematics and science teaching by honoring teachers publicly.
- Support the notion and recognize efforts that engage in continuous improvement by increasing R & D. there is an R&D component to sustaining development and support-- studies of the effectiveness of various support models, development of new content and pedagogy, etc.-- requires public investment (Elmore, 2006).

3. Elementary and Middle Bridge programs in science and mathematics.

- Use data to identify student misconceptions in science and mathematics and build supports around those specific concepts, attend to them using technology and other engaging strategies to plug gaps in our pipeline to high school and college.
- Study high poverty low performing districts that have transformed into high poverty high performing districts and analyze the lessons learned. El Centro School District has made claims and provides evidence that could be useful in making decisions to support science instruction.
- Public investment in summer bridge and afternoon programs for 5th and 8th graders that attend to both intervention and enrichment for students and parents.
- Fund parent programs that allow access and engagement with teachers and district leadership.

- Follow-up with high school internships and apprenticeships, particularly for high poverty, low performing campuses and communities in California.
- 3. Build University, Business, City, Community, and Museum partnerships that support 1-3**
- Support partnership structures with institutes of higher education that focus on changing the culture of BOTH institutions so that STEM faculty see the value and expertise of leading mathematics and science teachers in our district nationwide. They will begin to refer more of their student toward careers in education and also gain a better understanding of what public school students need to know and be able to do.
 - Continue to fund science partnership grants and opportunities available to both higher education and K-12 institutions to spur innovation.
 - Foster and support 2-year and 4-year college articulation that helps structure alliances and collaboration in support of K-12 educational objectives.
 - Support partnerships between city governments, local educational agencies, universities, and State and National Parks and Recreation programs to maximize the use of public lands and funds to advance scientific inquiry, student civic action, service learning, and parent involvement.

As indicated in the Science Framework for the 2009 National Assessment of Educational Progress developed by WestEd and the Council of Chief State School Officers:

... In the rapidly changing world of the 21st Century, science literacy is an essential goal for all of our nation's youth. Through science (and mathematics) education, children come to understand the world in which they live and learn to apply scientific principles in many facets of their lives. In addition, our country has an obligation to provide young people how choose to pursue careers in science, technology, (mathematics, and engineering) with a strong foundation for their post-secondary study and work experience. Our nation's future depends on scientifically literate citizens who can participate as informed members of society and a highly skilled scientific workforce-both well prepared to address challenging issues at the local, national, and global level...

Thank you this time to today in helping frame your work while adding our perspective from the Los Angeles Unified School District.