

Innovation in Education through Business and Education STEM Partnership

July 22, 2008

Congressman Miller and honorable members of the committee, it is with great pleasure that I speak to you about the Mickelson ExxonMobil Math and Science Teacher Academy. My name is Dr. Ramona Chang and I am the Director of Curriculum for the Torrance Unified School District in Torrance, California.

Our district, as well as other districts around the country, face an extraordinary difficult challenge. The curriculum standards for our students have become more rigorous and the accountability for both teachers and schools has increased exponentially. Teachers must provide high caliber learning experiences for our students, however all too often our teachers rely on scripted textbook instructional outlines or uninspiring labs. If our students are to become our future engineers, computer scientists, mathematicians, and environmentalists, we need to change the way we approach the teaching of math and science. A systemic change in teaching requires on-going powerful professional development in math and science.

Through the collaborative efforts of Phil and Amy Mickelson, ExxonMobil, National Science Teachers Association and Math Solutions, an exemplary professional academy for elementary educators has been realized. As I reflect back on the past three years of our involvement with the academy, I am amazed by the dynamic and exciting results that have been achieved through the process!

During our week at the academy, our teachers, together with other teachers from all over the United States, collaboratively work together to focus on math and science curriculum and the resulting successful student outcomes. With the academy week as our starting point, our teachers are able to continue their professional learning at the individual school site level, as they apply their new knowledge into the daily work of their students. An additional benefit of the academy is the development of teacher leadership skills as evidenced by returning teachers assuming work on curriculum committees or site professional development planning teams.

As an ever-growing team of academy teachers, we continue to meet at the district level in order to build new learning experiences for each other. If you were to drop by one of our sessions, you would see teachers experimenting with new teaching strategies, all with a focus of continuously increasing their effectiveness with science and math instruction. Academy teachers have been taught how to plan creatively, teach constructively, and reflect objectively. These skills rank in the proverbial “priceless” category for educators.

Upon returning from the academy, one school team was so enthusiastic that they wanted to create an institute similar to the one they experienced the previous summer for all the third through fifth grade students in their school (200 students). To do this they needed funding, so they applied for, and were awarded, a Science Technology Engineering and Math Pegasus grant from our local ExxonMobil Torrance Refinery. In their application the teachers wrote, “We are enthusiastic and want to recreate a Science Institute similar

to the one experienced this summer where wonderment is encouraged and the possibility of pursuing a career in Science is made a realization. If the teachers are this excited, imagine how the students will feel!”

At this newly, teacher created, Future Scientists of America Institute, the students have the opportunity to learn science content and make connections between science and their own experiences in a hands-on meaningful way. Each experience begins by engaging students in a large group demonstration to pose an inquiry that will foster scientific literacy. After each kickoff demonstration, students have smaller sessions with their individual classroom teachers in order to conduct further experiments, while recording their own reflections and findings in their science journals. The Future Scientists of America Institute will lead to further science exploration and the extension of concepts and skills to new situations. By planning collaboratively across the grade levels, teacher colleagues will be involved in the selection of different experiments to conduct each year. Through the Future Scientists of America Institute, the original Mickelson academy teachers, together with eight other colleagues, will experience firsthand the instructional approaches they will be using with their own students. This project both improves the science learning of all the students and deepens the teachers’ content knowledge resulting in better meeting the rigorous science academic standards.

However, creating change one grade level at a time, although commendable, could not ensure positive student outcomes through an extended period of time. We needed to tap into our academy “experts” in order to create a district-wide math and science fervor. The

first year cadre got the process started by working together as a district leadership team, focused on the alignment of state math content standards and math performance objectives. We met on a regular basis for the purposes of learning, lesson planning and problem solving together. Since we already represented several grade levels we felt the next step was to develop vertical grade level articulation, which we believed was essential in laying the necessary groundwork for success in subsequent math courses. What we quickly realized was that our discussions needed to also include middle and high school teachers. This resulted in the development of a kindergarten to 12th grade (Advance Placement Calculus) group of math teachers known as the Math Achievement Committee. Teacher committee members focused their attention on examining the standards students are required to master, planning more effective lessons and solving the new challenges of teaching. As a team, they determined which additional professional learning would be helpful to assist them in acquiring the necessary knowledge or skills. This has resulted in a district-wide common focus and clear direction for professional and student improvement in math and science.

At the end of this year's academy we will have 36 educators that have had this wonderful experience. The quality professional development that the academy provides is the key for supporting significant improvements in student learning and professional learning of teachers. The shared academy experience has fostered professional collaboration throughout the district. Inquiry and reflection with other academy teachers has changed the culture of our schools and district.

As a group, we have developed a mindset that educators build intellectual strength through a high level of rigor and depth. The experiences of the academy helped build that mindset, and it is that mindset that will nurture and support our citizens of tomorrow – our students of today.