

Math and Science Advisory Council Meeting  
November 16, 2007  
Santa Fe Institute  
10:00 am to 4:00 pm

Committee members or alternates in attendance: Bob Eisenstein (chair), Joyce Kaser (facilitator), Toney Begay, Franny Dever, Irene Lee, Helen Cesarez-Smith, Ed Spivak, Richard Nygren, Brian Every, Ellen Levy, Len Duda, Laura Crossey, Patrick Lopez  
MSB staff in attendance: Pascal Buser, Rick Scott, Claudia Ahlstrom, Mary Jo Daniel (note-taker)  
Visitors (partial list): Susan McIntosh, Cliff Ross, Reema Zeineldin

Bob welcomed the group; Joyce reviewed the group norms established at the last meeting.

Rick Scott reviewed progress made to date on Strategic Action Plan actions by the MS Bureau:

- “Forward mapping” of the 9-12 math standards (looking at alignment with post-secondary math courses and work place expectations) completed with representatives from Dept of Higher Ed.
- Submitted 9-12 math standards Quality Review II (next step of the revisions process) to the American Diploma Project
- Math Development Group worked on K-8 math standards (McREL proposed changes)
- Rick and Claudia now considering impact of revisions to the math standards on NMSBA
- Waiting for completion of alignment of ADP Benchmarks (9-12 math) to suggested model course sequences; ADP is proposing that math standards are for a 4-course sequence (Algebra I, Algebra II, Geometry, Data Analysis & Probability)
- Bureau is conducting a survey (electronic) of districts to identify needs related to implementing new math and science requirements
- Bureau is planning to meet with HED on data about preparation of teachers
- Bureau facilitated a meeting of professional developers at the NMSTA/NMCTM Preconference 11/1/07; over 80 attended; presentation and recommendations available at PED website
- Pascal reported that he has made progress in matching teachers with students in the state’s data system; will meet with HED to look at data needs across departments
- Mary Jo reported on efforts to address increasing family involvement; made a presentation at Enlace Family Institute and is working with PED’s Family Involvement Committee
- SB 611 made appropriation last year to develop an online math and an online science course with the national laboratories; current proposal is to develop Introduction to Nanoscience and Fractal Math courses

#### Reports from Subcommittees

Ed Spivak (PR/Marketing) –hand out provided (attached)

- Held a meeting with Cordova Public Relations (CPR)
- CPR observed that MSAC did not include representatives of large businesses with M&S programs in schools; educational programs offered by companies are generally targeted for a specific purpose

- May be opportunities for public/private collaboration to have a larger impact across the system
- May want to invite large corporations to participate in conversations about plans of the MSAC subcommittee related to PR.

Comments/Discussion:

Teachers have a difficult time forcing anything new into the curriculum because it is highly prescribed by standards, so we need to consider how Advisory Council can take advantage of what's offered and deal with protocols and strategies for how to get them into school to be used effectively. How do "outsiders" develop curriculum that is used in schools?

It's hard to force a new curriculum into science and math classes right now. The better way is to work with teachers to have them develop a curriculum they can use (e.g., Materials Science course developed in APS) that supports standards.

Energy companies want to develop workforce at graduate student level. GK-12 program connects future scientists with classroom teachers; encourage support of graduate students to partner with teachers to improve math and science education and future scientists who support education.

Large companies have a vested stake in having a large pool of potential employees; they could help get more support for science and math teachers and perhaps parents. Introducing new, supplemental programs shouldn't make life tougher for teachers but there are resources teachers could take advantage of.

Teachers need to know the types of opportunities offered by companies; perhaps we need to help communicate that information to teachers.

BP has approached MESA and NMSTA as partners on the "A+ for Energy" program. BHP has approached MESA as partners, also.

Legislators are concerned with the new graduation requirements for those segments of the workforce not planning to attend college.

PR Task force has not yet addressed cultural outreach issues of math and science.

What is the possibility of having a partner working in the school to train teachers to do hands-on science? Who is a partner?

Showcase examples, e.g., role-model from a company, to illustrate something cool and exciting in science. Enroll the support of the industry and show teachers something valuable; create a library of examples of applications—technology being used in the real world. Here are companies doing important things; here are the tools they are using (math and science).

We need to understand better "vested interests."

### Len Duda (Partnerships)

- Sent emails to committee members: focused on 2 things:
  - Definition of partnership—what it means, how they'd be working with this group
  - Develop a list of potential partners; have developed broad categories
- Action plan for next month: review information sent on defining partnership and develop a definition and accumulate names of potential partners

### Comments/Discussion:

Some science jobs are not going to be well-received due to cultural and local issues; so culturally appropriate science and math needs to be addressed.

Goals 2 and 3 of Strategic Action Plan have a lot of overlap; the two committees need to coordinate efforts.

### Ted Stanford (K-12 and Higher Ed)

Look for ways to encourage effective interactions between K-12 and HED and look for ways to improve collaboration across departments and programs within HED institutions. This could have a major positive impact on pre-service training and on professional development.

- Getting information needed:
  - Find out what each institution of higher education (IHE) is doing already; finding contact information at each IHE
  - Find out from school districts what “their side” of the story is on this issue, what would be helpful—how to do this?
- Have collected information on what works already. NSF and Dept. of Ed have some materials on this issue.
- Ted will be at a meeting of STEM faculty involved in K-12 partnerships.
- Goal is to have a document that shows what the collaboration looks like: here's what this partnership does for you and everyone's role. Attitudes and encouragement are key—getting teachers to know that faculty care and that faculty knows teachers are working hard.

### Comments/Discussion:

Data from Bureau survey of districts may provide information relevant to sub-committee.

In elementary school, math and science must be connected to reading; we need to bring in IHE reading departments.

Will corporations give teachers money to buy materials? If so, we need to get information to teachers.

Presidential Award winners—where are they? How can we draw on what they have done that can be used as an example for others.

APS got in-service days for all elementary teachers. Kristen Umland brought members of UNM's and CNM's math department to help as presenters in the math professional development. They've gotten a mixed reception when going to other school districts to offer a similar model. Bringing district level administrators together to have a discussion on how IHE and public school collaborations can work.

The Council divided into sub-committees to work on next steps.

Lunch provided by Project GUTS was delicious!

During lunch:

Irene Lee provided an overview of the Project GUTS program which works with middle school students in Santa Fe in summer and in after school programs. Students will share outcomes of projects at Roundtables; the first is December 1 at Monte del Sol Charter School. Currently have 80 students in 7 locations in Santa Fe; expanding statewide

Dr. Reed Dasenbrock, Secretary of Higher Education Department addressed the group and identified key areas HED is working on:

- Policy innovation has focused on interface between HS and College; new legislation working on developing a true P-20 system. Specifically, he mentioned elements of the High School Redesign Act, AP development, pushing for ACT to be administered by PED in 11<sup>th</sup> grade.
- There's less innovation in higher education policy itself. This is a NM education problem and higher education is doing a horrible job.

Slides available at the HED website: [www.hed.state.nm.us](http://www.hed.state.nm.us)

Dr. Veronica Garcia, Secretary of Public Education Department also addressed the group:

- Thanked the Advisory Council for their service and handed out materials on longitudinal data (available separately).
- Made comments about math and science education in NM:

We are in a crisis situation. We have rigorous standards yet they are still not at the same level as international standards. We do not want to lower standards to increase rates of making AYP. Asked Council to support our standards and increasing rigor through Achieve (ADP). Our challenge is to train our teachers to teach those standards. We have an aligned system to a degree, but we don't have anyone checking to see if we are doing what we should. Other systems go in more depth, less breadth. We need to look at our standards and cull the essential ones. Looking at a voluntary math curriculum, but should we be mandating a curriculum for schools that are not performing well? How can we become more aligned as a state? Second issue is preparation—after 3<sup>rd</sup> grade should math and science be taught by generalists? Should there be content specialists that support a generalist teacher? Challenged council to think “out of the box” things we might want to pursue from a policy perspective, perhaps pilot to strengthen instruction and preparation in math and science. How do we recruit second career folks with a strong STEM background? Council might want to have conversations around the state with math and science educators and leaders to discuss issues/brainstorm ideas. Dual enrollment should help, especially for high achieving students, overall achievement and graduation. What kinds of incentives could the state provide to attract top level students to go into education?

Making salaries more competitive is on the right track, but we haven't yet attained levels we need.

Should we have content specialists starting at K?

Policy recommendations have more weight if they are coming from a statewide Council; Council should make recommendations based on research and should "vet" them.

Funding policies are moving to be even less restrictive, not more directive to districts.

Singapore has a very tightly aligned system. There is a very heavy emphasis on testing; 100 hours per year PD per teacher; principals are carefully vetted to be sure they are suited. Need support at the school site to implement best researched practices. Teachers don't have much autonomy—everybody does the best practice which takes away from creativity of being a teacher. They do a better job with CT; everybody is prepared for a career or college. We do better at Special Ed.

Rick Scott asked for input from the Council on the Math and Science Day, set for February 5, 2008. We have 10 tables for displays in the Rotunda and an hour for recognition/celebrations.

Suggestions for recognition made when drafting the Strategic Action Plan: PAEMST Winners, Board Certified teachers, math and science faculty and scientists who have done outstanding outreach, schools that have raised NMSBA scores, Science Fair, Olympiad, Bowl, Sunflower Prize and Math Counts winners.

Other suggestions made at meeting:

- Identify a Legislator from the House and from the Senate--a thank you for support of math and science or the legislature as a whole.
- Link to photo opportunities
- Supercomputing Challenge winners
- Summer Institute providers
- NM Fractal Challenge winners
- Organizers of INTEL ISEF
- This should be done every year.
- Who will pay for subs and get kids out of school?
- Get corporate tie-in
- Have kids accept for schools

Display tables suggestions:

- Fractals
- Work on all fronts of the Council's activities (Goal Teams)
- Santa Fe Science Initiative put out hands-on materials
- Best Practices
- Sunflower Prize
- Display on the importance of data in making decisions
- MESA

Idea of having a “Science Bowl” with legislators and students was re-presented; it may be too ambitious for this year. If there is a “hot topic” being discussed on the floor or in committees, legislators may not be able to attend.

#### Website for MSAC

Mary Jo presented a prototype that had been developed by Hernan Miranda at NMSU for the Council’s consideration. During discussion, questions were raised about the audience for the site, how the site would be maintained, levels of access, whether it will appropriately serve the needs of the Council, and its content.

Irene Lee, Len Duda, and Jonathan Wolfe will work with Mary Jo to develop a proposal with more details for consideration at the next meeting.

#### NM Project 2012 (Scientists in the Classroom)

Bob Eisenstein reviewed a current project aimed at getting engineers, scientists and mathematicians working in K-12 schools, called NM Project 2012. Goal: within 5 years NM K-12 students will be among the nation’s leaders in math and science achievement.

Thrust 1: Start with 3 metro areas: Albuquerque, Las Cruces, Santa Fe. Link a SciAd to every K-12 school (~200).

Thrust 2: Provide rural connectivity via IDEAL-NM, Cyber Academy, traveling scientists

Draft proposal planned January 1; NM \_Project\_2012 website being launched; PR campaign being conceptualized.

Explora has received funding from NSF to work on a similar project; need to keep connected. They are still working on figuring out how the program will be developed and delivered. Stability and reliability are key features of a successful program.

A procedural point was raised about protocol of having presentations at MSAC on specific projects. This presentation was requested by Rick Scott; others may be requested in the future.

It was decided that there was not sufficient time for the math lesson prepared by Ted Stanford; the next meeting will start with this activity.

**The next meeting will be Friday January 11, 2007 in Socorro.** Irene Lee is checking with NM Tech about a location. Bosque del Apache is also being considered.

#### Evaluation of Meeting

##### **Plus**

Lunch

Well organized agenda

Facilitation helped us stay on agenda

SFI was a great facility for the meeting

Break-outs were short but welcome

Thanks to Rick for inviting Secretary Dasenbrock and Secretary Garcia  
THANK YOU Irene for the excellent lunch!

**Deltas**

Formal breaks of about 15 minutes to stretch or take care of personal business  
Give task group information to Mary Jo ahead of time to paste into minutes

In the future, articles for distribution will be sent out electronically, with an appropriate subject line, rather than given out on paper at the meeting.

**Math and Science Council**  
**Goal #2 Report**  
November 16, 2007

***Goal #2: Raise public support and awareness of the importance of science and math to New Mexico's economic health and security***

**Met with Cordova Public Relations**

Clients: energy, healthcare, insurance, electronics, utilities, schools, cities, & state gov departments.

Capabilities: public relations; media relations; opinion-leader outreach; issues management, tracking and analysis; and community involvement networking.

Team: 5 full-time supplemented by freelancers

**Cordova PR observed:**

- M&S Council doesn't have representation/participation from large businesses that already have M&S programs underway in the schools, e.g.:
  - BP Oil—recently spent \$500,000 in renewable energy grants to teachers.
  - Devon Energy—sponsors science night for elementary school children and parents.
  - Intel—Sponsored International science fair.
  - Other companies also have school science programs (BHP, Phelps Dodge, Sandia, etc.)
- Should target elementary schools since kids are making career decisions earlier.
- Other major corporations with a NM presence can be approached, e.g. Boeing, Lockheed, General Dynamics, Northrop Grumman, & GE.
- Business/industry have a vested interest in a skilled workforce, hence could be willing participants in a public/private partnership in support of Goal #2.

This effort needs an umbrella organization (public/private partnership) that will provide cohesion, continuity, coordination, measure results, and easy participation. Need clear, concise messages with goals, metrics and schedules.

**Recommendation**