

Session Number: 19

Abstract Name: **First Experiences from the Great Valley MSP Start Partnership**
MSP Project: Planning for a Math and Science Partnership for the San Joaquin Valley of California
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1. Questions(s) or issue(s) for dialogue at Learning Network Conference session:

- What has worked for existing, successful MSP Institute Partnerships?
- Strategies for working with school districts that are under tremendous pressure to improve test scores and often in program improvement.
- Experiences with and opinions about structured authentic research experiences for teachers as a strategy for improving teaching and learning.

2. Context of the work within the STEM education literature and within your MSP project:

The *Great Valley Math and Science Partnership* is a two-year *NSF-MSP Start Partnership* between California State University, Bakersfield (CSUB) and the Kern High School District (KHSD) as the core partners with the support of a broad and strong coalition of community partners, including the Kern County Superintendent of Schools, science museums, industry, and non-profits. The partnership will serve a region with high incidence of poverty, diverse demographics, generally low levels of education, and limited English language skills, as well as a mixture of urban and rural schools. Figure 1, below, shows the structure of the partnership and its core and supporting partners.

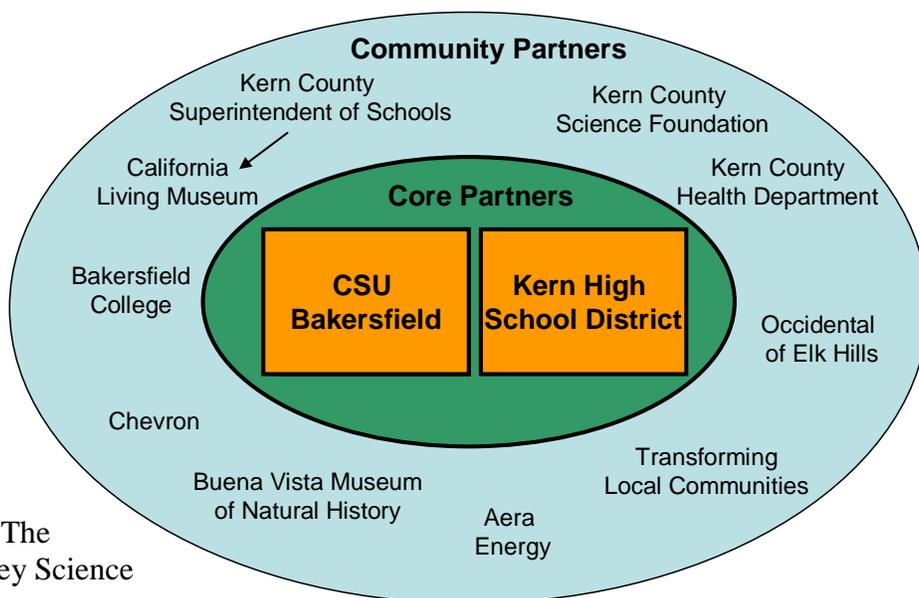


Figure 1. The Great Valley Science Partnership

The goal of the planning effort is an *MSP Institute Partnership* that will develop a group of master teachers through a multi-year program of study in math and science content, pedagogy, and leadership. Teachers completing the program will receive a post-baccalaureate certificate or a Masters of Arts degree in Teaching of Science or Math.

In the six months since the grant award, we have assembled the *Core Planning Team* consisting of CSUB disciplinary faculty in the sciences, math and education, CSUB administrators, KHSD teachers and key administrators, as well as representatives from the County Office of Education. We have also begun to assemble the *Community Advisory Panel* with community partners committed to improving science education in the region and to creating a successful science partnership that is sustainable in the long term.

The Core Planning Team has been working on the *Needs Assessment* for the project. In November 2009, KHSD disseminated a teacher survey to all math and science teachers at their 22 school sites. A total of 532 teacher surveys were disseminated (300 math surveys and 232 science surveys), based on the number of teachers in the district as of October 2009. A total of 340 teachers (184 math and 156 science) responded to the survey. In some cases where teachers taught both math and science, teachers completed two surveys.

3. Claim(s) or hypothesis(es) examined in the work:

The full *Institute Partnership* will have a strong emphasis on authentic research participation opportunities and other hands-on experiences for teachers, in addition to more traditional classes and workshops. The research experiences will be accompanied by opportunities for reflection and structured activities designed to translate the experiences into high school classrooms. This approach builds on existing strengths and research participation programs at CSUB (e.g., Stockton et al., 2008; Baron et al., 2004 and 2006; Baron, 2004). The partnership will create a group of teachers with a strong commitment to investigation and experimentation. The evaluation plan will focus on collection of data to document the effect of this approach, compared to typical book learning. The full partnership will also collect data to test the hypothesis that by teaching science and doing measurements and experiments, reading, writing and math skills are also improved, counteracting the common lament that schools cannot teach science because they have to focus on reading, writing and math because of standardized testing. The partnership will add to the limited existing evidence that research participation by teachers can lead to improved student learning (e.g. Silverstein et al., 2009).

4. Evaluation and/or research design, data collection and analysis:

Formative evaluation activities that are conducted during the planning process include (1) assessing and documenting members' level of satisfaction with the functioning of the Planning Team and Advisory Committee; (2) designing and implementing a tool to assess the degree to which the Partnership focuses on and accomplishes proposed tasks under each of the five MSP Key Features; (3) documenting and assessing the degree to which data from the needs

assessment process is used in strategic planning (i.e., evidence-based planning); (4) assessing teacher needs for the proposed experiential training workshops; and (6) documenting challenges and successes faced by the Partnership in carrying out proposed activities.

Summative evaluation activities for the full future MSP Institute Partnership will focus on the question, “What impact does the type of instruction have on student performance?” We will use an experimental research design in which the performance of students in classrooms where teachers have been trained in best practice approaches to content and pedagogy are compared to the performance of students in classrooms where teachers have not participated in Institutes and are practicing “teaching as usual.” Other outcome measures will include (1) assessing the degree to which, over time, project activities significantly increase the quality, quantity and diversity of science teachers in the KHSD; (2) determining whether and to what degree the project develops state-of-the-art education programs in science at the post-secondary and graduate level that offer maximum preparation for professions in the sciences and/or teaching; and (3) determining whether and to what degree changes in core curriculum at the secondary, post-secondary and graduate levels are institutionalized.

5. Key insights that have value for the Learning Network:

Since the Great Valley MSP Start Partnership is only in its very early beginning stages, the main goal of the presentation is to seek feedback from other established and successful partnerships.

Preliminary findings reveal that less than 40% of teachers surveyed had recently participated in professional development opportunities that focused on pedagogical methods and skills in their discipline, effective use of technology in their classroom, or how to offer experiential learning opportunities for students. When asked what would motivate them to participate in a post-secondary education program, 62% of teachers indicated that a stipend would motivate them, while 65% agreed that they would be motivated to participate if the program were offered for free. About half the teachers prefer a summer program. The two factors most commonly cited by teachers as things that would get in the way of them participating in a post-secondary education program were time (52.1%) and money (53.5%).

Teachers were asked to rate the extent to which they agreed with a series of statements on a scale from 1 to 7 (1=Strongly Disagree, 7=Strongly Agree). High agreement ratings were observed for the following:

- I would appreciate more opportunities to work collaboratively within the science community (M=5.74, SD=1.38)
- My students benefit when I participate in professional development (M=5.78, SD=1.19)

Furthermore, using the same scale, teachers expressed high confidence in their ability to:

- Put what they learned in workshops/trainings related to their subject area into practice in the classroom (M=5.79, SD=1.07)
- Work collaboratively with other teachers in their field (M=5.92, SD=1.10)

Teachers were asked to recommend one thing they thought was absolutely critical for CSUB to consider when creating a new post-secondary certificate or degree program for math and science teachers. Some of the most common recommendations, in order of importance, included:

- Provide practical and relevant material for classroom teachers
- Content should be applicable for implementing at the high school level
- Content should be specific and relevant to the courses that teachers teach
- Information and strategies suggested should be technologically relevant
- Courses should address practical ways teachers can engage difficult students, or special populations, including English Learners
- Teachers want ideas for challenging their students
- Teach teachers how to effectively address content standards and other requirements
- Provide ideas for lesson plans that specifically involve laboratory work
- Provide concrete opportunities for information sharing with other teachers/professionals in their field
- Teachers would like to learn from hands-on experience
- Teachers are not interested in theoretical lectures that are sometimes outdated

Aside from teacher input, district administrators and site level administrators from the Kern High School District are participating in telephone interviews regarding the grant. To date, 10 interviews have been completed. Preliminary findings suggest that administrators are highly in support of the proposed project. Administrators agree that support for math and science teachers is crucial and agree that the creation of the proposed program would offer great potential for improving student performance in math and sciences.

References

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- Baron D., Negrini R., Palacios-Fest M, Auffant K. (2006) Climate history of the southern San Joaquin Valley of California, USA: Authentic paleoclimate research with K-12 teachers. *Eos Transactions of the American Geophysical Union*, Fall Meeting Supplement, Abstract No. ED13A-1208.
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