District-Unviersity Collaboration is Alive and Well and Living in California

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Abstract: The author describes an induction program for new teachers that has prospered for a decade, involves a collaboration between a local district and a university, and uses Connected Mathematics as its curriculum.

STRAND: Models of Support for incoming mathematics teachers

This article describes a successful Model of Support for new teachers that has been in existence in Bakersfield, California for a decade. It is an example of strong collaboration between a local high school district, Kern High School District (KHSD), and the Bakersfield campus of California State University (CSUB). It provides evidence that teachers grow and thrive when they are able to participate in long-term, meaningful collaboration in a mathematics community of practice.

Kern High School District (KHSD, http://www.khsd.k12.ca.us/), established in 1893, is headquartered in Bakersfield, California, serves the county of Kern located at the southern end of the San Joaquin Valley, is California's largest 9-12 high school district with more than 35,000 students and 3,500 employees, encompasses about 3,500 square miles (about 43 percent of the total area of Kern County), and includes 18 Comprehensive campuses, 6 Alternative Education campuses, 2 Career Technical Education sites, and 4 Special Education centers. Forty-nine percent of the 840,000 residents of Kern County are Hispanic or Latino and one-fifth of the population lives below poverty level.

In 2002, Margaret DeArmond was the mathematics resource person for KHSD, having spent her entire teaching career in the district. Joe Fiedler was a professor in the Mathematics Department of CSUB and had spent more than a decade in Bakersfield building strong ties between the university and the local K-12 districts. In 1997, the state had created the Beginning Teacher Support and Assessment (BTSA, http://www.btsa.ca.gov/) program, a state-funded induction program co-sponsored by the California Department of Education (CDE) and the
California Commission on Teacher Credentialing (CCTC). It was designed to support the professional development of newly-credentialed teachers during the first two years of their teaching, including providing advanced subject matter content knowledge. DeArmond and Fiedler developed a plan for providing the advanced mathematical content knowledge for the mathematics teachers who were in their second year of the district’s BTSA program.

Each year there have been between 18 and 25 participants in the workshops. In the initial year, there were four “monthly” all-day workshops held between January and May 2003. The model was repeated from January through May 2004. The leaders in the district were pleased enough with the program that it was extended to seven workshops the following year by including three during the fall semester 2003. This format has continued until now with commitments already in place for 2012-2013.

The core curriculum for the workshops consists of units from the Connected Mathematics Project (CMP, http://connectedmath.msu.edu/). CMP is a curriculum project housed at Michigan State University that was originally funded by the National Science Foundation 1991-1996 and then again in 2000-2006 for revisions, CMP2. Fiedler had worked with the materials that were predecessors of the CMP units. This author, who has participated in the project since the beginning, had taught from the materials with middle school students as well as using them in a project in which they were used in a CSUB mathematics course for preservice elementary teachers (Lutz & Berglund, 2007).

In the collaboration between KHSD and CSUB, the district provides the meeting room, the CMP units and materials, light snacks, and the district’s mathematics resource person. The university’s role comes from being a regional site in partner with Cal Poly San Luis Obispo for the California Mathematics Project (CMP). The California Mathematics Project (http://www.cmpso.org/)
supports 19 regional sites located on University of California (UC), California State University (CSU), and independent college and university campuses to provide programs that strengthen teaching and learning in mathematics. The CMP is one of the nine subject disciplines that comprise the California Subject Matter Project (CSMP). The CSMP is supported by the state of California and is administered by the University of California Office of the President. All CSMP disciplines share common goals and program elements
to further their mandate in providing professional and leadership development for K-12
teachers throughout the state.

CSUB’s regional site provides two or three faculty members from CSUB’s Mathematics
Department for each session as well as handheld technology for each participant. The
technology has been a TI-73 graphing calculator
(http://education.ti.com/educationportal/sites/US/productDetail/us_ti73.html), a view-screen
panel and a Calculator Based Ranger (CBR2) data collection device
(http://education.ti.com/educationportal/sites/US/productDetail/us_cbr_2.html) manufactured by
Texas Instruments.

In determining the Connected Mathematics units that would be used, the leaders assumed
that the participants, as new teachers, would be assigned to teach mostly lower-level courses
such as pre-algebra and Algebra One or lower. The initial four units were *Bits and Pieces II*
(understanding fraction operations), *Variables and Patterns* (introducing algebra), *Covering and
Surrounding* (two dimensional measurement), and *Data About Us* (statistics). The three units
that were added in 2004-2005 were *Moving Straight Ahead* (linear relationships), *Filling and
Wrapping* (three-dimensional measurement), and *How Likely Is It?* (probability).

The typical first activity for one of the workshop days is to have participants share their
“homework” results. At the end of each workshop, participants are asked to choose at least one
problem from a suggested list that are in the day’s CMP unit and use it in their classroom before
the next workshop. They are asked to bring back a sample of the student work and use it to
report to the group regarding “how it went.” The discussions that take place during this part of
the day are often rich as teachers describe and show the reaction of their students to the
problems.

Each workshop day is dedicated to a single CMP unit. The participants go through the
*Investigations* as learners, and choices always need to be made regarding what parts of the units
will be left out, what will be hit lightly, and what will be emphasized. Sometimes discussions
“break out” during the workshop day that cause a time adjustment. The sacrificed coverage is
considered worthwhile in such situations.

Beginning with the first workshops in 2003, including information regarding the
importance of engaging students in high cognitive-demand tasks was included. QUASAR
(Stein, Smith, Henningsen, & Silver, 2009) research activities are used. In May 2009, a survey
was sent to all past participants in the workshops that could be located. One of the survey items was the following: Please rate the following statement: KHSD/CSUB second year BTSA workshop series were helpful in raising or maintaining a higher cognitive level of discourse in my classroom. Of the 37 who responded to the survey, 10 Strongly Agreed, 21 Agreed, 3 were Not Sure, 1 Disagreed, and 1 Strongly Disagreed.

Another survey item asked the participants to rate their agreement with the following statement: KHSD/CSUB second year BTSA workshop series were helpful in developing my classroom style. Of the 37 who responded to the survey, 10 Strongly Agreed, 24 Agreed and 3 were Not Sure.

During the 2011-2012 workshops, an increasing amount of information was provided to participants regarding the Common Core State Standards with an emphasis placed on the Standards for Mathematical Practice (http://www.kernhigh.org/instruction/commoncore/). Andy Hicks, the district’s mathematics resource person, pointed out that the teaching that is modeled via the Connected Mathematics units is consistent with what is advocated by the Common Core and that the Standards for Mathematical Practice emphasize the importance of cognitive demand as described in the QUASAR research.

Another survey item asked the following: Do you use "Connected Math" materials for instructional support? Following are a sample of the responses:

“They are fantastic! Engaging! Have already ordered some and plan on ordering as many as possible.”

“I feel that it helps the students be more engaged. It helps them discover the concepts more on their own and see how the mathematics we are learning is relevant to their lives.”

“Good questions that are engaging and require the students to think.”

Most of the workshop days included approximately 90 minutes in which the participants used the handheld technology to do one of the CMP Investigations or an investigation related to the topic of the day. Twenty-eight of the thirty-seven survey respondents indicated that they use graphing calculator technology in their teaching ranging from daily use to “very occasionally.”
Seventeen of them stated that they continued to use the TI-73 with others using TI-83/84 or TI-Nspire technology.

Several years ago, a few special education teachers in the district heard about the workshops and asked if they could attend. Most years since that time, there have been from one to three such teachers who participate. They add a valuable perspective to many of the conversations about teaching and greatly appreciate the hands-on, in context approach to mathematics. One of them commented about the TI-73 by saying, “Really helps my special education population to make sense of the concepts.” Some people might wonder about the possible contradiction that a workshop that raises the cognitive demand of student tasks is sought after by special education teachers. Yet, those who understand the power of teaching mathematics in context while emphasizing understanding over memorization are not surprised at all.

More recently and largely due to the financial crisis in California and the rest of the nation, the district’s hiring of new teachers is lower than it was previously. The leadership saw this as an opportunity to extend the invitation to include some teachers beyond the BTSA group. The mixture of a few veteran teachers with the new teachers has been beneficial and further increased the richness of the conversations. The participants appreciate the opportunity to collaborate with others via the workshops. It is a community of practice.

Ten years after Margaret DeArmond and Joe Fiedler acted on their plan for collaboration to provide support for new teachers in the Kern High School District, the model not only still exists in its original structure, but it seems to become more vibrant every year. It is already showing signs that it will be one of the tools that the district will use to incorporate the Common Core State Standards.

References