

STRATEGIES FOR TEACHER EXCELLENCE PROMOTING STUDENT SUCCESS

2003-2004 Annual Report

Project Activities Summary

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Strategies for Teacher Excellence Promoting Student Success (STEPSS) was a five-year, \$3.9 million project that received initial funding in August 1998. A sixth year of STEPSS-supported activities was made possible through a no-cost extension for 2003-2004, so the official ending date for the STEPSS project was July 31, 2004.

STEPSS was designed to strengthen and enhance the mathematics content knowledge and instructional expertise of over 800 K-6 teachers, administrators, and preservice teachers in the Visalia Unified School District (VUSD). The district is located in the heart of California's agriculturally rich San Joaquin Valley and serves 25,000 ethnically- and linguistically-diverse students in grades K-12. California State University, Fresno (CSUF) and Fresno Pacific University (FPU) are the major graduate universities in the region and were active partners in the STEPSS project. A faculty member from each campus coordinated the STEPSS master's cohorts on that campus and also served as a Project Co-PI.

Project Goals – The STEPSS Project consisted of a number of elements that were carefully designed and interwoven to produce systemic, long-term change at each school site and to achieve the Project's major goals: (a) to increase and support elementary teachers' knowledge and confidence in mathematical content, learning theory, assessment techniques, and instructional strategies; (b) to develop administrators and teachers to serve as mathematics curricular leaders and peer coaches at their respective sites, and (c) to increase the mathematics achievement of all of the district's students.

Teacher Institute – Each year, the entire faculty from three to five K-6 schools participated in STEPSS-related experiences. This model (as opposed to a cross-district, grade-level-span model) proved quite effective in developing a community of learners within each school. The initial experience in STEPSS was an intensive one-week Institute, "Teaching and Assessing for Understanding," led by Kathy Richardson and consultants from Mathematical Perspectives. During the Institute (which was typically held twice a year to accommodate various year-round teaching schedules), teachers learned ways to search for evidence to ensure that each student was effectively developing the capacity for independent mathematical thinking. Attention was given to creating a learning environment that allowed teachers to assess individual children and meet the range of instructional needs in their classrooms. This Institute was credited with challenging and changing teachers' perceptions of the nature of mathematics and what it means to be an effective teacher of mathematics. Approximately 750 VUSD teachers and administrators, 11 preservice teachers, and 10 out-of-district teachers participated in formal STEPSS training. (This does not include the "mini-

STEPSS" experience received by over 200 preservice teachers enrolled in CSUF and FPU Elementary Mathematics Teaching Methods courses taught by STEPSS coaches in Visalia.)

During the no-cost extension year (2003-2004), the STEPSS goals expanded to include a Literacy/Mathematics project for the district. This project focused on 10 schools formally identified by the state as Program Improvement sites. The district supported 2 district Math Coaches and 2 district literacy coaches to share a classroom and alternate months coaching the designated site coaches. As an outcome of the STEPSS project, school sites determined that having content coaches on their campus would be beneficial for teacher support and student achievement. During the course of the school year, 14 site math coaches were supported by the district Math Coaches.

Teacher Leader Institute – In addition to the Teacher Institute, a weeklong "Institute for Teacher Leaders in Mathematics" was provided for administrators and for teachers desiring a greater leadership role at their school site. The institute provided an in-depth look into the theory of how children learn mathematics, effective instructional practices, and ways to provide peer support. The Teacher Leaders were viewed as key mathematics resource teachers by others at their school site and supplemented the support provided by the STEPSS Coaches (4-6 teacher leaders on Special Assignment to provide support for the teachers at STEPSS school sites).

Each year, the Project modified and enhanced the format of the Leadership Institute for the next cohort of leaders based on feedback from the current teacher leaders. During 2000-2001, the five-day Teacher Leadership Institute was expanded to seven days--three days in early fall for the initial Leadership Institute, followed by two days in January and another two days in May. This format allowed leaders to have yearlong support from Kathy Richardson.

Teachers and site administrators participated in the Teacher Leadership Institute during the spring of 2002. The teachers identified the need for quality mathematics materials to aid in implementing a solid mathematics program for students. *Investigations in Number, Data, and Space* training was thus offered throughout the year to 3rd-6th grade teachers who recognized the need for quality mathematics resources in the upper grades. Gail Lowe-Parrino, educational consultant, provided the training for teachers. Her extensive knowledge of the California state standards and of the *Investigations* materials gave teachers the opportunity to engage in meaningful mathematics.

During 2003-2004, *Investigations in Number, Data, and Space* training was offered at several sites to accommodate the growing interest among K-6 teachers and administrators in quality mathematics resources and instruction. The response to this training has been very positive and teachers have requested further professional development opportunities. Gail Lowe-Parrino has proven to be a valuable asset for promoting content, instruction and student achievement.

Cognitive Peer Coaching – Another important element of the STEPSS training was a seven-hour workshop in Cognitive Peer Coaching (CPC), provided by Bill Baker of the Institute for Intelligent Behavior. Teachers learned how to assist a partner in critically assessing and reassessing his or her lessons. "Planning" and "reflective" conversations were discussed and practiced during the CPC sessions.

During 2002-2003, a goal of the Project was for the Math Coaches to receive extensive training in the Cognitive Peer Coaching model and in turn be able to become coaching trainers within the district. Bill

Baker worked exclusively with the Math Coaches to help them transition to this new role. Cognitive Coaching training for other district teachers was ongoing throughout the year at each school site. This model became a necessity due to the shortage of substitute teachers in Visalia Unified. This model has been quite effective in meeting the needs of teachers.

During 2003-2004, site and district coaches participated in content focused coaching sessions with Marilyn Tabor. Tabor used the essential components of cognitive coaching to support coaches and teachers in reflecting upon their instruction in relationship to state standards.

Behind the Glass – The Cognitive Peer Coaching Training was followed by a half-day 'Behind the Glass' (BG) demonstration and a Practicum experience (two half-days). The BG classroom is a large room that has been divided into an observation room and a classroom by a wall containing a one-way window. A sound system allows observers to easily hear what is being said in the classroom. During the BG demonstration, a Math Coach provided facilitation of a math lesson for the teachers in the observation room while the lesson was taught in the classroom by another Math Coach. Teachers were free to ask questions or dialogue with the Coach while the lesson was in progress. (Preservice elementary teachers from CSUF and FPU also participated in a BG experiences as part of their mathematics teaching methods classes.) At the conclusion of the demonstration, the two Math Coaches modeled a 'reflective' conversation about the lesson. The teachers were then allowed time for collaboration on a lesson that one of the teachers would present the next day in the Practicum.

The classrooms of the district literacy and mathematics coaches are fully equipped behind-the-glass classrooms. These classrooms were used throughout the 2003-2004 year to support the Literacy and Mathematics project. Site coaches were encouraged to bring teachers from their school site to observe the district coaches teach these teachers' students behind the glass.

Practicum – During the Practicum, peer partners took turns observing and coaching each other. Following a lesson, the observing teacher led a reflective conversation with the teacher who taught the lesson. The following day, the partners switched roles and repeated the process. The teachers were provided approximately two hours each day for collaboration and planning for future mathematics lessons. The STEPSS Math Coaches were available for support as needed during these two days.

The practicum was incorporated into the Coaches' visits to the site at the beginning of the year. Opportunities for reflective practice were also included within the site schedule at the end of the year.

University Courses/Workshops – Each teacher in the STEPSS program was required to participate in at least 30 hours of mathematics content courses, which many teachers satisfied by attending two series of five monthly half-day workshops offered by mathematics educators from the partner universities. This requirement was waived for teachers who elected to pursue a master's degree with an emphasis in elementary mathematics education from either California State University, Fresno or Fresno Pacific University. During the first year of the grant (1998), over 80 teachers enrolled in one of these master's programs; their tuition and fees were supported in part by grant monies. A second cadre of 74 master's students began their graduate studies two years later.

In the spring of 2003, a cohort of 20 teachers began the journey to earn their master's degree with a focus in K-6 mathematics curriculum and instruction from California State University, Fresno. This was the third and final cohort to be supported by the STEPSS grant. This cohort is on target to

complete their master's degrees in Spring 2005, and many plan to attend the NCTM annual convention in Anaheim during April 2005. STEPSS supported a 2-day symposium provided by Dr. Jim Hiebert about the TIMSS video study in April 2004 at CSUF for the cohort members and 125 other teacher leaders throughout Central California.

One of the most successful components of the STEPSS grant has been the surprising number of teachers who accepted the challenge of earning a master's degree with a focus in K-6 mathematics—nearly 25% of the district's teachers now have their master's degree (and enhanced knowledge of how to teach mathematics) as a result of the STEPSS grant.

On-site Coaching – During the year following a school's initial STEPSS experience, the STEPSS Math Coaches made monthly visits to the school for two days of coaching, support, collaborative lesson planning, and/or demonstration lessons. Half of the members of the Coaching team supported grades K-2 teachers and the other half supported grades 3-6 teachers. On the first day, each Coach brought a substitute teacher with a prepared math lesson, providing the classroom teacher with thirty minutes of release time so they can hold an individual planning session with their respective Coach. The Coach used the planning map from cognitive coaching to clarify the teacher's needs. The support provided to the teachers during the second day was based on the needs identified during the first day coaching session. Support took a number of forms but typically included modeling teaching strategies, performing individual student assessment, and side-by-side teaching and assessing with the teacher. During the years following this first year of support, Coaches visited school sites once a month, and the site Teacher Leaders assumed more responsibility for school site leadership and support.

Six Math Coaches served STEPSS teachers at their school sites during 2001-2002. Three Coaches supported K-2 teachers and three supported the grades 3-6 teachers. During Spring 2002, one of the primary coaches left the team to become a full-time math coach at Goshen Elementary School. This school was one of the first schools identified by the State Department of Education as a Scholastic Audit School. (This was a term used by California to identify schools where student performance on the SAT 9 over a 3-year period is unacceptably low; these schools receive 4 visits a year from a state review team that identifies areas that need to be improved.) The Scholastic Audit identified that the school site needed support in mathematics. The Math Coaches were enlisted by the District to answer this call. A second elementary school, Houston, was also designated by the State as a Scholastic Audit school. Instead of committing to the school full-time for assistance, the Math Coaches arranged their schedules to coach teachers at their school sites each week to provide additional support.

Five Math Coaches provided on-site coaching support to the school sites during 2002-2003. The coaches focused on the Scholastic Audit Schools as well as the three schools participating in their first year of STEPSS.

In addition to the 2 district Math Coaches, 14 site mathematics coaches supported 10 sites during 2003-2004. As the STEPSS project drew to a close, the shift to site mathematics coaches was important and successful. All STEPSS Coaches from 2002-2003 either became district or site math coaches.

Ongoing Support – Opportunities were also provided during the year for teachers to visit any of the 14 Demonstration Classrooms (classes of Teacher Leaders who invite observers to drop in and observe

lessons). This feature of the program was added at the request of participating teachers who wanted the chance to see the strategies in action in classes with skilled teacher.

In addition, teachers were invited to participate in a variety of after-school mini-institutes on topics ranging from developing number concepts to effective assessment strategies. Many schools held Family Math Night events and hosted mini-workshops with math consultants.

To facilitate communication and information distribution, Co-PI Carol Fry Bohlin maintains an online listserv, COMET (*California Online Mathematics Education Times*), that continues to keep VUSD staff and interested teachers and administrators on the cutting edge of news, opportunities, and information related to mathematics education (see <http://csmf.ucop.edu/cmf/comet/>).

Each elementary site identified a mathematics/science teacher leader for 2003-2004. The leader became a very strong link between their site and district office in communicating mathematics and science news, resources, and opportunities. An exciting component in the communication with the leaders was in the form of technology. Most correspondence and resources were shared via the internet. This opportunity expanded the capabilities of each leader to provide timely information to every member of their staff.

STEPSS also continued to financially support the teachers enrolled in the CSUF master's program during 2003-2004.

Research – Attitudinal and mathematics performance data were collected by the Project and analyzed by Carol Fry Bohlin. Approximately 2000 students from Cohorts 1 (1998-1999), 3 (2000-2001), and 5 (2002-2003: control group) submitted complete attitudinal surveys. An analysis of scale score means for students of teachers who participated in these three cohorts revealed significantly higher scale scores (indicating more positive attitudes toward mathematics) for students whose teachers had participated in STEPSS for the longest period of time (Cohort 1) compared with students whose teachers were members of Cohort 3 or Cohort 5. Further, scale scores were significantly different between Grades 3 and 5 and between grades 3 and 6, with scale scores of 3rd graders higher than scale scores of 5th and 6th graders. 4th grade scale scores were significantly higher than scale scores for 6th graders. These findings demonstrate a significant slide in positive feelings toward mathematics as measured by the scale as a whole among students in grades 3-6, a finding that was independent of cohort membership.

Differences in the SAT 9-Math means for the 2000 and 2002 administrations of the test were examined by cohort membership (1, 3, 5) for 1363 students. For students whose teachers were members of Cohorts 1 or 3, SAT 9 means rose over the 2-year period. The most dramatic positive growth in SAT 9 math scores was shown among the students of teachers in Cohort 3, who started STEPSS during 2000-2001. *Negative* growth is evident overall for students in Cohort 5 (control group) over the same 2-year period of time. Interestingly, the 2-year achievement gain for students in Cohort 3 during 2000-2002 masked a drop (negative growth) in performance between 2000 and 2001. This is not uncommon during the first year of implementation of a project, and was followed by a dramatic and significant rise in mathematics performance between 2001 and 2002.

The results of this study provides evidence that participation in STEPSS activities by teachers is positively related to (a) their students' performance on standardized mathematics tests after the first

year of implementation and (b) student attitudes toward mathematics. These findings were presented at the American Educational Research Association (AERA) in San Diego, CA on April 13, 2004. The title of the presentation by Carol Fry Bohlin (paper co-authors: Naomi Kent and Samantha Tate) was "Mathematics Attitudes and Achievement Among Students in Grades 3-6: Impact of the Duration of Teacher Participation in an NSF-Funded Professional Development Project."

A master's thesis entitled "Teacher Participation in an NSF-Sponsored Professional Development Project and Students' Mathematics Performance in Grades 2-6" is in development. Naomi Kent is working with STEPSS Co-PI Bohlin and with STEPSS Director/PI Samantha Tate on this project, which will examine the relationship between Cohort affiliation (Cohorts 1-5, not just 1, 3, and 5 as previously studied) and student performance on the CAT 6, SAT 9, and California Standards Tests (as well as the school's API and AYP scores). The thesis should be completed in May 2005 and available by Fall 2005 from California State University, Fresno through Interlibrary Loan.

Presentations and Project Profiles – Since the first year of the Project, the STEPSS Project Director and Mathematics Coaches have made numerous presentations to school administrators, teachers, district school board members and administrators. Project components and progress have been shared at the monthly Central Valley Math Network meetings. One of the PIs, Dr. Carol Fry Bohlin, gave an invited presentation on STEPSS to the President's Commission on Teacher Education at California State University, Fresno, in December, 1998. In June 2000, Dr. Bohlin was again invited to address the President's Commission to provide an update about STEPSS.

The STEPSS staff helped organize and facilitate several Family Math nights at Project schools. In addition, Family Math activities have been facilitated at four evening Migrant Family meetings for Project and non-Project schools in Visalia Unified School District. Several educators from neighboring districts have expressed interest in the Project and have participated in a variety of Project events, including the Institutes.

On November 6, 1999, a 14-person panel delivered a presentation about STEPSS at the California Mathematics Council's Southern Section conference in Palm Springs. (Attendance at this popular conference typically exceeds 4500.) The university Co-PIs, the Project Director, the four STEPSS Coaches, two principals, and five Teacher Leaders participated in this panel presentation.

A half-day STEPSS workshop was presented at the National Council of Supervisors of Mathematics' conference held in Chicago during April 2000. In January 2001, then-Project Director Darryl Medders, Co-PI Carol Fry Bohlin, and one of Dr. Bohlin's graduate students, Judy Russ, gave a presentation on STEPSS at the Association of Mathematics Teachers Educators (AMTE) annual conference, held in Orange County, California.

Two STEPSS coaches (Lori Goebel and Dana Hight) and Project Director Samantha Tate gave a presentation at the National Council of Teachers of Mathematics' 2002 conference in Las Vegas (topic: "Building Sense with Numbers").

Project Co-PI Carol Fry Bohlin moderated a session on NSF Local Systemic Change (LSC) projects during the 2002 NCTM conference. Lucy West, F. Joseph Merlino, and Dianne Spresser participated in this session. Dr. Bohlin, Bill Frascela, and F. Joseph Merlino also received funding from NSF/Horizon Research to Co-Direct a one-day conference for LSC Project Directors: "How to Win

Friends and Influence the Public in the LSC Mathematics Reform Movement." The three also participated in the Second Virtual Conference on Local Systemic Change (TERC) on May 1-May 8. Their topic was "Public Engagement: Addressing the Political, Cultural and Constraining Factors Influencing Math Reform" (available online at <http://sustainability2002.terc.edu/invoke.cfm/page/13>).

Samantha Tate, Lori Goebel, and Dana Hight presented "Building Sense with Numbers" at the 2003 National Council of Teachers of Mathematics' Annual Conference in San Antonio. As mentioned in the section on research findings above, a paper co-authored by Dr. Carol Fry Bohlin, Naomi Kent, and Samantha Tate was presented at the American Educational Research Association (AERA) in San Diego, CA on April 13, 2004.

The STEPSS program and activities have been profiled in District publications, which increased further the profile of the Project in the district:

- (1) "STEPSS—Empowering Children to Think Mathematically!" *Visalia Reader*. July/August, 1998, 1(3), p. 6.
- (2) "Family Math Night at Mineral King Elementary," *Visalia Reader*. September, 1999, 1(4), p. 2.
- (3) "STEPSS Lead to Math Mastery," *Special Delivery: Spotlighting Special People, Programs, and Schools*. Winter, 1999, 3(1), pp. 4-5, 8.

Finally, the STEPSS Project was highlighted in a California Department of Education study published in June 2000. The "Mathematics Implementation Study" was funded by the California Department of Education and conducted by WestEd in partnership with RAND and Management, Analysis and Planning, Inc. In Chapter 7: Professional Development, pages 93-95, the study highlights the STEPSS project - "District Spotlight: A Professional Development Program that is Making a Difference." This recognition of the STEPSS Project came about because virtually every fourth grade teacher in Visalia Unified who was interviewed by the researchers voluntarily mentioned the impact that STEPSS was having on them and their school. The "Mathematics Implementation Study" report can be accessed at <http://www.edgateway.net/mis/>

[The full STEPSS report for 2003-2004 provides 40 additional pages of detail concerning Project activities and impact, teacher participation, and "lessons learned."]