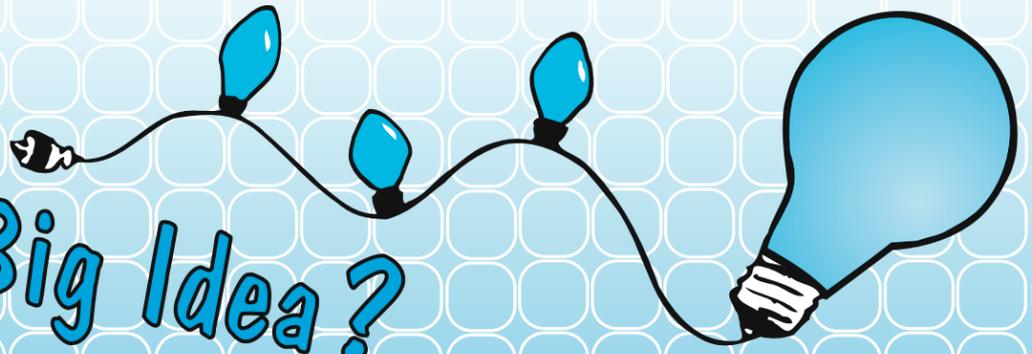


What's The Big Idea?



A Publication Of The K-12 Alliance: A WestEd Program

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In Their Words

Long before it was fashionable to do things collaboratively or to imagine that faculties from institutes of higher education would be interested in K-12 education, the K-12 Alliance began a crusade of finding scientists and mathematicians who would work with us to create quality science and math education for our students.

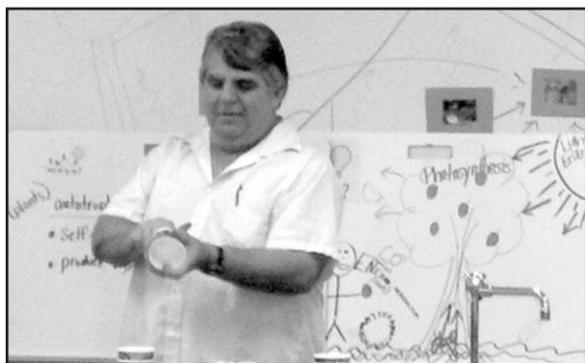
We didn't have to look hard to find wonderful people, many of whom had already developed a deep commitment to improving K-12 education. Against nay-saying ivory towers colleagues – and often being judged as less than real scholars for working with K-12 audiences – these fine men and women have made tremendous contributions to the math and science professional development field. They have increased teacher content knowledge, sparked teacher enthusiasm and, in return, have been challenged to think about their pedagogy as they teach their students.

We have been fortunate to build long lasting relationships that are mutually beneficial, synergistic and fun! Here, in their own words, is why scientists and mathematicians enjoy collaborating with the K-12 Alliance.

"I work with K-12 educators because I saw the need when the new science standards were released. I had boys in elementary school at the time, and was active in their classes, and I saw that most teachers wanted to address the standards but just weren't prepared. Not because they didn't try, but the previous liberal studies programs just didn't have the science content necessary to be able to understand (much less teach) the life science and physical science standards. I now realize that effective teaching goes way beyond understanding (and teaching to) the standards, but the standards were my awakening that a need for additional content existed.

I have worked with teachers through a number of avenues and programs, but have never seen anything run as smoothly and effectively as the K-12 Alliance. The planning and staff development is second to none, and it is so nice to be part of a cadre, knowing that I can rely on my fellow cadre members to fill in where I am weak.

We cadre members have developed relationships that allow us to complement one another in ways that I never could have imagined before joining the K-12 Alliance, and the pedagogy I have learned through them definitely impacts the way I approach teaching at the university. So much so that I pushed through (over significant resistance) the first "integrated" program in biology (fusing the BA in Biology with the Single Sub-



SMOOTH OPERATIONS — Biology Professor David Polcyn says that the success of the K-12 Alliance "is rooted at the top with extraordinary people. I hear nothing but rave reviews from teachers."

ject Teaching Credential) in the Cal State University system. I would have never even begun to put together the integrated program had it not been for the positive interactions I had with everyone at the K-12 Alliance.

The success of the K-12 Alliance is obviously rooted at the top, with extraordinary people putting together a great group of staff developers and cadre, and planning and executing meetings and TLCs which the teachers find not only educational, but enjoyable.

Proof of the effectiveness of K-12's efforts is the comments I hear from teachers who have been involved. I hear nothing but rave reviews from teachers, even though many came in with skepticism and a negative attitude about 'yet another staff development meeting.' That feedback from teachers, and wonderful people I've had the pleasure of working with through the K-12 Alliance, is what keeps me coming back.

*David Polcyn, Ph.D.
Professor of Biology
Chair, Department of Biology
California State University, San Bernardino*



FRIENDSHIP AND PROFESSIONALISM — Professor Laura Henriques (left) and assistant professor Babette M. Benken credit the K-12 Alliance as positively impacting science education as well as being a great way to meet and make new friends.

"California State University, Long Beach's Science Education Department has been partnering with the K-12 Alliance for more than two decades and it's been a synergistic relationship that continues to evolve and mature. Both organizations benefit from the partnerships as we are able to impact science education together in ways that neither entity could individually. Many of our part-time faculty have links to K-12 Alliance (as staff, professional developers, cadre) and most of our tenure track faculty have worked on K-12 Alliance related grants and projects.

At the moment we are partnering with K-12 Alliance on two CPEC grants and an MSP grant. These projects provide us with increased opportunities to provide professional development, do research in schools and work with K-12 teachers. What we learn in these projects is ultimately shared with our colleagues at CSULB and beyond."

*Laura Henriques
Professor and Chair
Science Education Department
California State University, Long Beach*

"I have worked on and off with K-12 teachers since 1985. Working with K-12 teachers gives me

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exposure to that part of mathematics that I am not exposed to in teaching college students.

Working with K-12 Alliance has been one of the most rewarding experiences in that:

- The team that I work with is awesome. I have made many new and lasting friendships.
- The fifth grade teachers that we work with are incredibly humble about their math skills but are truly gifted in their teaching ability and absorption of the math content. Our institutes are exceedingly productive because of them.
- The evaluation tools are extremely sophisticated so that we receive accurate feedback on fifth grade teachers and their students. The results have been phenomenal so that it makes all of our hard work worth it."

*Karen Tabor
Professor of Mathematics
College of the Desert, Palm Desert*

"My goal in working with K-12 educators is to improve teachers' mathematical content and pedagogical content understandings, as well as attitudes toward mathematics. Research suggests that a teacher's knowledge and beliefs directly influence students' understanding and achievement. I taught secondary mathematics for five years almost 20 years ago – I loved it and since that time, have had a desire to do more to improve K-12 mathematics education.

I enjoy working with K-12 Alliance because all of the teachers are excited about learning and being at the institutes. They really enjoy the hands-on, activity driven mathematics curriculum, as well as learning in a collaborative format with colleagues.

Since I have taught a wide range of grade levels (teachers in grades 5-9), it has helped me to improve my ability to differentiate instruction to meet the individual learning needs of the teachers. Although I attempt to simultaneously scaffold and challenge future participants' learning during planning, working with the teachers in the moment provides me new experiences for learning how to respond to each learner's needs, as well as the collective expectations of the group."

*Babette M. Benken, Ph.D.
Assistant Professor
Graduate Advisor (Mathematics Education)
Dept. of Mathematics & Statistics
California State University, Long Beach*

IN THEIR WORDS, CONTINUED ON PAGE 2

Be Part of the Solution

BY KATHY DIRANNA

As I write this, the presidential candidates are getting ready to debate again. When you read this, one will be the leader of our country. What it took for that person to win was for the American people to act on their convictions.

As with presidential elections that enable us to take stock and decide who and what will take us forward in our country, the development of a revised science framework helps our state to decide what will take us forward for science education. Like the presidential election, the outcome will be based on people who act on their convictions.

It's time to find your voice.

How long has it been since you were able to teach science in a meaningful way? How long has it been since all students in your school actively participated in a science class? How long has it been since you had adequate professional development time devoted to improving science education?

It's time to find your voice.

How many of you have tried to make sense of the standards, only to find the framework lacking in specificity as to what it looks like in a classroom? How many of you have had to work with instructional materials that look more like literacy than science? How many of you are scrounging for authentic activities for students to investigate because the "quick labs" just don't cut it?

It's time to find your voice.

Our current science framework is being reviewed. This framework guides teachers, administrators and parents on how a standards-based curriculum is used in classrooms; it also contains criteria that publishers must address in developing instructional materials for state adoption.

Although the standards will not be revised in the near future, the framework is updated periodically to ensure that it reflects current and confirmed research on education.

You can take an active role in the review process by applying to be on the framework committee. Applicants will be submitted to the Curriculum Development and Supplemental Materials Commission (Curriculum Commission). The Curriculum Commission will submit a list of recommended applicants to the State Board of Education for appointment in March 2009.

If you are selected, meetings will be held June through October 2009 and will take place in Sacramento. The updated framework will be released in 2010 and will set the guidance for science until the year 2017!

Act now. The recruitment letter and application are available on the CDE website at www.cde.ca.gov/ci/sc/cf/ (refer to 2010 Science Framework Update and then Curriculum Framework and Evaluation Criteria Committee letter).

If you can't be on the committee, you can find your voice in other ways. Be prepared. Gather data. Begin discussions with parents and community members. Learn how to advocate for quality science at your school and in your district. Visit the CSTA website for up-to-date information about the framework. When public hearings are posted, go and speak, or write your ideas and send them to the State Board of Education. Attend K-12 Alliance professional development programs. Meet with like-minded educators who stand for quality teaching and learning.

What ever you do, don't drop out. Remember, if you are part of the precipitate, you can't be part of the solution!



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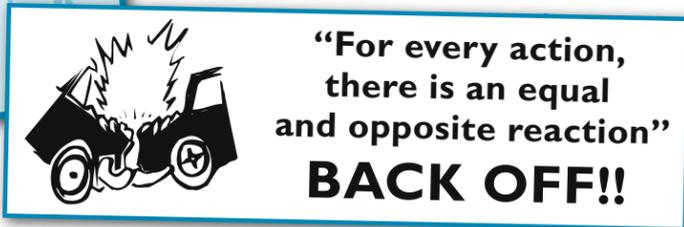
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Far North (Butte, Del Norte, Glenn, Humboldt, Lassen, Modoc, Plumas, Shasta, Siskiyou, Tehama, Trinity)



IN THEIR WORDS, CONTINUED FROM PAGE 1

"I really enjoy working with teachers; they are a great group. They are committed to their profession and they appreciate the help they get in learning science content and pedagogy.

The K-12 Alliance provides us with excellent training. We get the opportunity to collaborate with other instructors and staff developers to put together some very powerful lessons. It has been a very positive experience and lots of fun.

I have revised many of my labs as a result of my work with K-12 Alliance. There is a lot of questioning, problem solving and student-to-student interaction. I think I have done a better job getting across big ideas and essential information. Also my teaching and questioning skills have improved. I use non-verbal practices in classroom management. I've learned a lot, but still have lots of room for improvement."

Craig Poole
Geology Instructor
Fresno City College, Fresno

"The College of Science and Mathematics' Science and Mathematics Education Center (SMEC) at California State University, Fresno works diligently along side of the K-12 Alliance to provide

content enhancement to Valley teachers while making connections to practical applications in the K-12 classrooms. SMEC takes great pride in working with our partners from the K-12 Alliance and others in order to provide this outreach to Valley teachers to assist in reform efforts within our K-12 schools. Our purpose is to promote researched based 'best practices,' including the highly acclaimed K-12 Alliance Teacher Learning Collaboratives (TLCs), which is very similar to the Lesson Study approach to teaching.

As our faculty from Fresno State provides content instruction, they are also influenced by the methods of teaching being employed in the K-12 classroom. This is a win-win situation for everyone involved. Our hope is that together we can help strengthen the facilitation of student learning so that all students are better prepared college bound students and citizens who will make significant contributions economically and socially to the valley, state and nation.

David Andrews
Biology Professor and Director of SMEC
Jaime Arvizu
Assistant Director of SMEC
California State University, Fresno

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LEADERSHIP



Taking the Challenge

BY JENNIFER WEIBERT

Professional development sounds like a good thing to teachers, but all too often, we choose not to get involved because we say we are either “too busy” to leave our classrooms or we think we have been teaching for a long time and “know enough.”

Despite these prevailing attitudes, I decided seven years ago to take the challenge of growing to be a better teacher for the students I serve. Looking back, I now realize I could never have dreamed that I could be at such a wonderful place as I am today. All it took was a series of little steps and the help of the K-12 Alliance.

My first experience was forced, when after my first year of teaching, my principal said I HAD to go to a two-week professional training session with the K-12 Alliance in the summer.

I dreaded the whole idea.

As it turned out, I roomed with the Teacher of the Year for California and another teacher who would turn out to be a great friend and work with me years later. Those two weeks changed my life forever.

I learned how to make instructional decisions like using storylines that my students would understand, so we both didn't have to blindly follow textbooks. I learned about TLCs and taught in groups during the school year; my regional director, Rita Starnes, saw potential in my teaching style, especially in my ability to connect with the students on hard content. She encouraged me to keep up with the training.



ON HER WAY — Professional development with the K-12 Alliance “changed my teaching — and my life!” says Jennifer Weibert, science coach.

I become a staff developer and went through three more years of training to facilitate teachers in my district. Even though I felt I had done enough, my principal told me to stay in and persevere. “Being in a program like K-12 Alliance could lead somewhere great,” he said. In addition, my family supported me to keep on going.

So, I continued with the program and joined the Literacy in Science Academy (LISA) for two years. I gained so much knowledge and pedagogy that my teaching changed once again.

Later, I jumped at the opportunity to join the Tulare City Schools MSP, as a three-year commitment on a life science cadre. I was now the one training the teachers how to teach better instead of being the one in the chair! It was thrilling to work with professors from across the state; consequently, I amassed a great network of professionals, people I can turn to even today for various help and advice.

During this time, I realized I was capable of presenting sessions at CSTA to share my knowledge with others. I have been able to share new presentations almost every year since then and look forward to doing more.

As time went on, my family life changed and I was ready to have a different schedule, so I wrote a job proposal to my district asking to be a science coach. While I wasn't happy leaving the classroom, I

LITTLE STEPS, CONTINUED ON PAGE 4

TEACHING & LEARNING



Conceptually Speaking...

BY LAURA OTTESON

(Editor note: Laura is a participant in a CaMSP math grant. Her reflections on what is important to teach applies to all content areas.)

Due to current educational mandates, all schools are under pressure to perform at top level and speed. Teachers feel rushed to teach their students ALL the standards prior to testing time. The question soon arises, “Is it the quality or the quantity of a curriculum that promotes the highest test scores?”

Being involved with the K-12 Alliance for the past 3 years has caused me to notice that we've strayed from what we should actually be asking, “Is it the quality or quantity of a curriculum that promotes the utmost learning?”

What I have learned from the Alliance about teaching for understanding has changed not just the way I think about mathematics, but also the way I teach other subjects. All curriculum needs to be student-centered. We have to stop giving students shortcuts to pass the test. Instead we have to teach conceptually in mathematics as well as subjects like science and history.

So, what does this mean – to have quality of a curriculum that promotes the utmost learning – and how does it affect my ability to teach my students conceptually? To me, it means looking closely at strategies that sound good at the beginning but cause problems down the line.

Case in point: those cute mathematical “rules/rhymes” I used to give students – which actually have nothing or very little to do with math – because they helped me keep up (somewhat) with the pacing guide.

As the year progresses, one “rule/rhyme” blends with another. Before long my students are misapplying the rules and are developing misconceptions. As these misconceptions become solidified and new schema has been created, it's hard for my students to “relearn” the correct way.

Here's an example: one of my fifth grade students was asked to compare fractions on an assessment. He misapplied the “rounding rule” (5 and up rounds up, 4 and down stays the same) to compare fractions. Because part of the question asked the student to explain his thinking, I realized that he had knowledge about both equivalent fractions and about rounding numbers. But he was over generalizing and misapplying the rules he'd been taught!

This made me think, “If a student doesn't know when to apply what he knows, does he really know it? And if he doesn't know it, then maybe teaching the rule isn't as effective as I thought.”

For the last three years, I've realized a few things about conceptual teaching and learning.

First, I need to find out what my students really know by getting them to talk to each other about mathematics. Student discourse is important in any subject. Second, I should require my students to show answers using multiple representations: pictures, words, number lines and graphs. Third, I need to make time to collaborate with my colleagues, use common assessments and analyze data from the common assessments so that I can monitor and adjust my instruction to meet my students' learning needs.

Finally, and most importantly, I learned that rules should be saved for behavior modification, and not math, unless the rule is discovered by the student(s). I

CONCEPTUALLY SPEAKING, CONTINUED ON PAGE 4

COLLABORATION



One Project, Many Hands

BY SUSAN ZWIEP

Imagine a group of different entities coming together to create change in ONE school. Sounds improbable? Well, it's really happening at Bell Gardens Elementary (BGE) in Bell Gardens, located in the Montebello Unified School District.

This Bell Gardens Science Partnership (BGSP) reunites old friends – the K-12 Alliance and California State University, Long Beach – once again in Montebello. The partnership (BGSP) also brings new friends to the project including local Informal Science Institutions (ISIs) – such as the Discovery Science Center – which are integral components for providing quality science experiences for elementary teachers and their students.

The collaboration doesn't stop there. This project brings science learning home so that parents and other community members are directly involved in educating their children beyond classroom walls.

The overall collective vision of the BGSP is for students in elementary school to have access to high quality science instruction that incorporates best practices from science education, English language development, and school-community partnerships. The project will blend mutually beneficial goals. Together, English Language Development (ELD) and science content institutes will provide teachers with a set of strategies that combine an understanding of how students learn science with how students develop language.

One central feature of this project establishes and connects the school with their families and the surrounding community – it is a “whole school” endeavor.

Parents will be able to better understand what their children are learning in school at various community events. Here, parents will discover ways they can help their children continue their science learning at home.

In turn, these community events will also help teachers understand the culture of the community and ways they can bring real world meaning to science instruction.

ISI sites will serve as “kick-off” locales for the project and provide fieldwork destinations where teachers gain and strengthen their science content understanding, as they approximate the work of scientists.

In addition, ISIs will also provide support to community events by participating in school events such as family science nights and offering free tickets and memberships.

The project collaborators expect Bell Gardens Elementary to blossom as school that embraces science. Indeed, with so many hands in project, students – as well as parents and faculty – will realize that support for science education is something that can't be contained in a textbook or even a school lab.

For these children, studying science in elementary school will be only the beginning of a long-lasting, eye-opening experience that knows no bounds or restrictions. The sky is the limit!



Going Forward Into The Classroom

BY GRETA SMITH

“The CaMSP funding will not support you to be out of the class another year, so you will be going back to the classroom.”

I knew this was coming and I was ready to return. I knew I would miss aspects of being a Teacher On Special Assignment (TOSA), like hanging out with the RD's, working closely with teachers, planning staff development opportunities, and writing up quarterly reports for the state (wait...will I really miss that one?!).

But I forced myself to look at the bright side; I would be back with eighth grade students, teaching for 6 periods, grading papers for 150 students, conducting parent conferences...Hold on! Was I really ready for this? Could it be? Did two years out of the classroom take “the eighth grade teacher out of me?”

As I stepped back into the room that had been my classroom for two years, I realized nothing had changed. The whiteboard and bulletin boards were in the same place; the desks could be moved back to where I liked them. This was my domain and I could control what happened in it. It felt good to be “home.”

This feeling continued as I prepared for the coming year. But all good things can come to an end. While planning my first weeks of instruction for my



students, I started to feel as if I had “lost” my edge. My lessons lacked something; I could not place my finger on what was missing. Exhaustion overwhelmed me as I tried to meet the needs of my students.

About two months into the school year, I “hit the wall.” I was disillusioned with my job and was not happy. Even though I returned to the school site that I had worked at before I left the classroom and was back with the same department staff, I felt out of the loop. What could be done to get me out of this funk?

While trying to figure out what was wrong, I pulled back from my feelings. Then it hit me. I truly missed working with adults. I missed working with teachers and helping them implement new teaching strategies in their classrooms.

On top of these feelings I was having about leaving my job as a TOSA, I had also lost sight of the impor-

tance that working with students had once held in my life. With these realizations in mind, the task at hand became balancing what I currently felt about the important work I had once done with the return to the important work I was currently doing in my classroom.

Even though I had lost sight of the vision and importance of my role as a teacher – to inspiring students to become life long learners – I realized that I was still in a sense working with adults – adults of the future.

An “A-ha!” moment, to be sure!

So I didn't just go back to the classroom, I was going forward into the classroom. Forward to continue the good fight of providing the best science education possible for each and every eighth grade student who will cross the threshold into my classroom and one day, be an adult of the future.

Greta Smith is an eighth grade science teacher at Richard Garvey Intermediate School in the Garvey Elementary School District, where she also served as a TOSA.

IN THEIR WORDS, CONTINUED FROM PAGE 2



SMOOTH OPERATIONS — Biology Professor David Polyn (far left) says that the success of the K-12 Alliance “is rooted at the top with extraordinary people. I hear nothing but rave reviews from teachers.

“My colleague, who had been working with K-12 teachers for several years, approached me to see if I would be interested in getting involved. He thought I had potential for helping teachers and for learning to be a better teacher myself.

My first experience hooked me. I was taken aback at how eager the teachers were to understand the science content that they were supposed to teach. I appreciated that they were giving of their precious time trying to improve themselves so that they could offer quality education to their students.

K-12 teachers' curiosity and enthusiasm for learning is unbounded. It is so motivating for me to see them engaging in the training that it makes me want to do even more. I think it is my obligation as part of the educational system to do all that I can to make it better for teachers and for students. And besides, it's damn fun!

Since there is no formal training to become a community college instructor, I started teaching

with no idea of how to teach. I just knew my content and began winging it. I've been told that I'm a natural at teaching, but there is so much more to it. While I might have some good genes for teaching, the K-12 Alliance has certainly nurtured my growth. The professional development I get from them goes a long way for what I do in my own classroom. The Alliance has given me structure and strategies for learning and I have found my path and direction for what I do.

From working with and around K-12 teachers, I have learned to facilitate rather than lecture in my college classes. My students work in small groups, with lots of discussion and doing things to show they understand, like concept mapping. I've changed my labs from cook-book to real inquiry-based learning.

Changing my style of teaching has also impacted my colleagues. I have mentored several part-time faculty members in how to ask good questions and facilitate discussions. When asked how I learned to do this, I respond: from my K-12 teacher colleagues.

The cycle continues with my college colleagues now helping me do professional development outreach to districts in our area.

Rodney Olsen
Biology Instructor
Fresno City College, Fresno

“I work with K-12 teachers for many reasons. For a start, K-12 teachers play an incredibly important role in the development of the next generation of scientists and leaders. I would like to do anything I can to help them succeed in this daunting job. My role is very focused – understanding and teach-

ing physical science. I believe that giving teachers a better understanding of the content builds their confidence and makes them better teachers. In addition, I want them to buy into an inquiry-oriented approach to teaching and learning science – not easy for some, but something that I can model for them through my interactions with them. Overall, I find teachers to be a very motivated and appreciative group. Working with them is always fun, exciting, and rewarding, and over the years has shaped my work with my college students.

The K-12 Alliance has played and continues to play an exceptionally important role in facilitating exactly the kind of teacher professional development that I believe worthwhile. Their supportive role in grant writing and curriculum development is immensely valuable. The collective experience that the K-12 leadership and the cadre members bring to teacher professional development is something I can't find in any other organization. It is a pleasure and a privilege to work with a group of professionals who share my goals and ideals.

Graham Oberem
Associate Dean, College of Arts and Sciences
Physics Professor
California State University, San Marcos



LITTLE STEPS, CONTINUED FROM PAGE 3

reminded myself that as a science coach, I could impact 600 kids a day. I designed a local institute this past summer for my district, which many thought few would attend; it was a full house.

One of my recent steps on the road to leadership was to help write a grant for my district, a challenge that put my past training to good use. Having been one that sat in the teacher chairs, I made sure that the grant addressed teacher needs. I knew the small details that made professors happy since I was on a cadre. And I was familiar with the needs of my district because of the summer institute I taught. As I write this article, we are

anxiously waiting to hear if the grant was funded.

Whatever the next years bring, I know that I will continue to be involved in professional development. After all it has changed my teaching – and my life! – in ways I never thought possible.

Thank you K-12 Alliance for believing in me; I couldn't have done it without you!

Jennifer Weibert has been teaching for Kings Canyon Unified for eight years and is currently a science coach for grades 6-8.

CONCEPTUALLY SPEAKING, CONTINUED FROM PAGE 3

know I learn best conceptually, and I'm attempting to give my students the same opportunity each day during my math instruction. It may not be as cute as those “rules/rhymes,” but in the end, students will leave my classroom with a better sense of applying what they have truly learned – and I'll have done my job.

Laura Otteson is a math coach at Palm Springs Unified School District.