

Catalyst

FALL 2010



Transforming Teaching and Learning in Science, Technology, Engineering and Mathematics

Raising Achievement through Science, Technology, Engineering and Mathematics

Our ability to provide a talented and globally competitive workforce depends upon our ability to increase learning and success in Science, Technology, Engineering and Mathematics (STEM) at each step along the educational continuum, from preschool through college, and we must make a concerted effort to attract more of the state's diverse students into STEM disciplines and careers. Accomplishing this will take creativity and determination to ensure better outcomes for the next generation.

The crisis in STEM education is truly alarming. California students' performance in science and mathematics is ranked near the bottom in the U.S. As measured by the National Assessment of Educational Progress, California eighth graders rank 47th among U.S. students in mathematics. We have to do better. And, we must start earlier to build a pipeline for students to major in math or science and to encourage them to pursue teaching as a career. We have a long way to go.

UC Davis has the assets and the vision to create a powerful system for transforming STEM education on a national level. Researchers, professional development experts and teacher educators in the School of Education have extensive knowledge about STEM education, from how to best engage youth in STEM subjects to how to prepare teachers for innovation in the classroom.

In this issue of the *Catalyst*, we celebrate the variety of approaches our faculty, students and professionals take to ensure STEM is alive and well in and out of the classroom.

One of the key issues in math and science education is assessment, or the process of evaluating students' mastery of a subject. Far too often the focus is on testing at the end of a unit or school year. In some very fundamental ways, this may tell us only what a student doesn't know, but rarely why




Photo by Neill Michel/Axion Photography

Dean Harold Levine

and usually too late. Several colleagues in the School are interested instead in formative assessment, an approach that enables teachers to assess a student's progress and to make adjustments in instruction to address lack of understanding long before the final exam.

Teacher preparation and ongoing professional development are two of our strengths in this area, as well. Our interdisciplinary approach and collaboration with four undergraduate colleges—Agriculture and Environmental Sciences, Biological Sciences, Engineering, and the Division of Mathematics and Physical Sciences in the College of Letters and Science—has made our work to increase the number and quality of math and science teachers particularly successful. Together, we have created the Mathematics and Science Teaching (MAST) program to encourage and mentor UC Davis math and science majors to explore teaching as a career. In just over four years, enrollment has grown from 22 students in 2005-06 to more than 400 in 2009-10.

We are leading an effort funded by the National Science Foundation to work with practicing science teachers on how to incorporate model-based reasoning into their instruction to make science more relevant and rigorous for their students. And we are bringing science alive outside the classroom through our Young Scholars Program and through our extensive work in afterschool programs.

These are just a few of the ways the School of Education is leading the way for reform in STEM education. I am hopeful this issue of the *Catalyst* will inspire you to consider a gift to the School to support our efforts to prepare more STEM teachers and to continue our research into effective teaching and learning in STEM. 

stem

- Noun:**
- the stalk that supports a leaf, flower, or fruit.
 - the base part of a word.
 - the underlying form.

- Verb:**
- to arise or originate.
 - to make headway against.

Science, Technology, Engineering and Math

MATT WALLACE: Spencer Fellow Tackles Teacher Preparation in Mathematics

By Stephannie Tornow

There is great power in math; most students just don't know how to harness it.

"Most students have no understanding about how useful math can be to them. Too often, they see math as a challenge, rather than an opportunity," said Matt Wallace, a PhD student in math education. Math taught well serves as a "bridge" from a subject often dreaded to one that empowers students to think conceptually and more deeply about the role math plays in a variety of fields, according to Wallace.

Traditionally math assessments have focused on close-ended answers and procedures with student mastery assessed through quizzes and testing. One result is that teachers feel pressure to teach to the test.

"This approach can reduce the typical math class to test preparation only. Assessment serves many purposes, but test scores should not be the main focus," said Wallace.

Instead, he argues the future of math instruction lies in contemporary methods which encourage students to reason, find patterns, and explore possible solutions to real world problems. Reform-based assessment methods focus on advancing learning, not just measuring it, so tasks involve problem-solving, multiple solutions and strategies, and communicating mathematical ideas. As students gain a genuine understanding of math, research shows that test scores increase as well, according to Wallace.

"Professionals who use math, such as engineers, aren't following rote procedures but solving problems," said Wallace. "Students, who learn about math as a concept, have a richer and deeper understanding of the fluidity of math and how it functions. Exploration and creating our own understanding of math becomes an assessment in and of itself."

However, a lot of professional development for teachers comes in the form of kits or day-long workshops with little to no follow up, which according to Wallace "is a problem because many of these ideas are quite foreign to teachers. Without sustained and math-specific professional development, many contemporary ideas get used in traditional ways. For example, a teacher may give students an open-ended task where they are asked to explain a pattern and use it to make predictions (reform-based), but grade the task as correct/incorrect (traditional)."

Wallace, who received the prestigious Spencer Dissertation Fellowship, is researching how pre-service math teachers in reformed-minded programs learn and deal with the challenges of teaching in a system which still values traditional teaching and assessment methods.

Wallace recognizes that the process is not easy. Math is the most highly scrutinized subject taught at the K-12 level, so it can be hard to overcome more hurdles on top of that. "Pre-service teachers have a lot on their plates, and we are asking them to do something they may not have seen in practice," said Wallace.

Wallace, who wants to be a math teacher educator, hopes his research will not only help him better know the challenges at every stage of pre-service preparation, but also help him understand how to prepare pre-service teachers and shape their assessment practices.

As Wallace explained, student teachers come in with their own experiences as math students (often taught in very traditional ways) and their own notions about how math ought to be taught. Their evolutionary process has many stages that can either help or hinder them in attempts to apply reform-based methods.

"We need to understand the challenges within that process before we can ever hope to get them to embrace more contemporary methods," said Wallace.

For example, pre-service teachers are not always placed with reformed-minded mentor teachers, and there can be a lot of tensions between what pre-service teachers are learning, what they are seeing, and what they are being asked to do. New teachers may leave their respective programs with reform-based theories and little practical understanding of how to apply them in the classroom.

In the end, Wallace concedes, "Student teachers have to see it for themselves. Until then, they have to truly believe this method of teaching works. It can be difficult for new teachers because at the end of the year they know they have to get those results. Sometimes, it just has to be a leap of faith." 📖



Matt Wallace

"Assessment serves many purposes, but test scores should not be the main focus."

– Matt Wallace

Mary Murphy Richardson (Credential '69)

Mary Richardson

retired from WCVB-TV in Boston last May after 30 years as reporter and anchor for the ABC affiliate. For most of those years, she co-anchored the award-winning daily newsmagazine program *Chronicle*, which has been syndicated nationally on the A&E Network and other cable stations, and hosted its popular segment, "The Main Streets & Back Roads."



Photo courtesy of UC Davis Magazine

Mary Murphy Richardson

Richardson traces the start of her TV news career to her first teaching job at Encino High School in Sacramento in the early 1970s. "I had one class where a lot of the students weren't interested in coming to school," said Richardson. "To get them interested, I bought a movie camera and encouraged them to write scripts so that I would film their movies. I became really interested in film and began taking classes and eventually that led me into reporting." She got her first reporting job in 1973 at KCRA-TV and quickly worked her way up the ranks. By 1978, news stations across the country were seeking Richardson's talents. With a brother studying at MIT, she chose a Boston CBS affiliate before settling in at WCVB. Richardson is currently community liaison with Caritas Christi Health Care.

J. Norman Grim (Credential '56, PhD '67 Zoology)

A biology professor emeritus at Northern Arizona University, **J. Norman Grim** wrote the book, *To Fly the Gentle Giants: The Training of U.S. World War II Glider Pilots* (AuthorHouse), which was released in 2009. He learned to fly in 1961 with the Cal Aggie Flying Farmers, later becoming club president and a member of its board of directors. His flying is now solely in sailplanes. Grim joined the Northern Arizona University faculty in 1967 and developed and directed the campus's electron microscopy facility. He continues to study protozoa, his research focus for more than four decades.

Stacey Caillier (PhD '07)

Stacey Caillier is the director of the new Teacher Leadership M.Ed. program at High Tech High Graduate School of Education in San Diego. Prior to joining High Tech High, Caillier was a graduate teaching fellow and an adjunct faculty member

in Hamline University's Graduate School of Education in Minneapolis, teaching courses on action research and sociocultural issues in education, mentoring practicing teachers, and presenting her work at multiple educational conferences. "I am excited to continue my work with teachers at HTH-GSE," said Caillier. "I am passionate about the role of teacher-leaders in creating schools that are equitable, inspiring, and relevant to all students." For more information, visit gse.hightechhigh.org/.

IN MEMORIAM

Julie Crouse Friedman (BA '91, Credential '92) lost her courageous battle with leukemia at age 40. Raised in Santa Rosa and an avid musician, Friedman graduated from Santa Rosa High School in 1987 and UC Davis in 1991, with honors from both. After earning her teaching credential, she taught elementary school for eight years in the San Mateo-Foster City School District. Prior to her diagnosis, she was an active member in her community, serving as PTA co-president and head of the book fair at her children's school. Friedman enjoyed scrapbooking, baking, and her role as "soccer mom." She was an avid San Jose Sharks fan, a true Jimmy Buffett "Parrothead," and always anxiously awaited her next mahjong game. Friedman was a single mom and is survived by her two young sons. 🐶



Photo courtesy of Yvonne Crouse

Julie Crouse Friedman

Catalyst



Editor: Donna Justice, Director of Marketing & Communications
djustice@ucdavis.edu, (530) 754-4826

Assistant Editor: Heidi Sciutto, Development Coordinator

Marketing Intern: Stephanie Tornow

Design: Steve Dana, UC Davis, ATS Mediaworks

Website: education.ucdavis.edu

FACULTY Updates, Honors and Publications

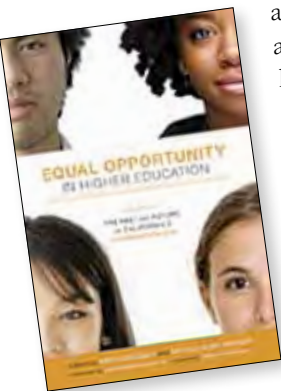
Heidi Ballard, an assistant professor in the School of Education, has been selected to be a 2010-2011 UC Davis Hellman Fellow and will receive an award of \$20,409 to be used in support of her research activities. The Hellman Family Foundation has contributed funds to establish the UC Davis Hellman Fellows Program to provide support and encouragement for the research of promising assistant professors who exhibit potential for great distinction in their research and who have documented a need for funding.

Cynthia Carter Ching has been invited to serve on the Editorial Board for the American Educational Research Journal.

Equal Opportunity in Higher Education: The Past and Future of California's Proposition 209, edited by **Michal Kurlaender** and Eric Grodsky, was published in October. The book examines issues pertaining to equal opportunity—affirmative action, challenges to it, and alternatives for improving opportunities for underrepresented groups—in higher education today. Its starting point is California's Proposition 209, which ended race-based affirmative action in public education and the workplace in 1996. Read more at www.hepg.org/hep/book/127/EqualOpportunityInHigherEducation.



Michal Kurlaender



Kurlaender has also been awarded a \$1.8 million federal grant to study a unique California program established six years ago to help high school students better prepare for college. The grant will fund a study of the California Early Assessment Program, which gives students information and advice about their readiness for the California State University. Kurlaender will conduct the study with Jessica Howell, a CSU Sacramento economics professor, and Eric

Grodsky, a former UC Davis sociology professor now at the

University of Minnesota. For more on this story, visit the School's website at education.ucdavis.edu/news-release/michal-kurlaender-receives-18-million-grant.

Lee Martin has co-authored a chapter in *National Society for the Study of Education's (NSSE) 2010 Yearbook: Research on Learning as a Human Science*.

Cindy Passmore's work in model-based reasoning is featured in a new article co-authored by Julia Svoboda, recent PhD graduate of the School.

Rick Pomeroy and **Allan Bellman** presented "When 1+1=3: Getting Three Hours of Instruction from Two Hours of Class: Integrating Math and Science in Middle School Science Classes" at the California Science Education Conference in October. Their seminar illustrated that through coordination of topics and schedules, data collected in science classrooms can be analyzed and modeled in the math classroom. This coordinated effort liberates science teachers from teaching math skills, allowing them to use the time for more productive discussions of science concepts. Pomeroy is President Elect of the California Science Teachers Association, the organizer for this annual conference.

Tom Timar received funding to pursue a new study: *Deregulating School Aid in California: How Local Educators Allocate Flexible Dollars and Stimulus Funds*. Funded by the William and Flora Hewlett Foundation, the Stuart Foundation, and the Charlene and Derry Kabcenell Foundation, the study's purpose is to examine school and district responses to the flexibility given them by the legislature through deregulation of 39 categorical programs.

Yuuko Uchikoshi has co-authored a chapter in Language and Literacy Development in Bilingual Studies. 📖

GIVING opportunities

Advancing Education Research Fund – Gifts to this fund contribute to new discoveries in education that make a difference for teachers, students, families and communities. For more information, go to giving.ucdavis.edu/schooled/research. 📖

Meet our **FACULTY**

Cynthia Carter Ching



What About the “T” in STEM? Is Technology the Answer?

By Donna Justice

Among the oft-mentioned challenges in education is the challenge of preparing students for success in the twenty-first century workforce. Technology is just as often cited as the solution.

The hope is that the use of technology in the classroom (for example, the use of video or an interactive whiteboard) will raise student performance, particularly in math and science. But it turns out that unless the instruction itself is challenging and engaging, the use of technology won't make any difference.

“Technology is just a tool,” according to education professor Cynthia Carter Ching. “Live streaming of a boring lecture is still boring.”

Ching, who is an expert on the use of technology for teaching and learning, says what students—and teachers—crave is “a real exchange of ideas.” Technology itself is just “a host of possibilities” for framing the dialogue.

The choices that teachers make about which technologies to use and why are what really interest Ching, who is working on a study about teachers and their perspectives on the use of technology in their classrooms.

According to Ching, we have years of research on how teachers implement technology, through studies on school culture or technology-infused curriculum, but we know very little about the ways teachers make decisions about their use of technology, especially in relation to the rest of their practice.

Ching, who also researches the connection between technology and identity, has discovered a decidedly low-tech way to get at this question: storytelling.

“This is what teachers do,” she says. “They tell stories about their challenges, what worked well and what didn't.”

But in telling these stories, Ching explains, teachers also draft a personal narrative. “The stories we tell ourselves become powerful. It is how we make meaning out of our experiences.” Ching surmises that as teachers use technology and build a narrative about their challenges and successes, they will become more savvy about its use and more effective as educators.

It is this connection between technology and identity that makes it so powerful for middle and high school students especially, but in the attempt to tap into their students' milieu, teachers often miss the point.

“Tech for tech's sake is still a mindset for a lot of teachers,” said Ching. “But students of this generation don't remember a time before information technology was a fact of life. They don't even really think much about any particular tool. They just use this tool for this purpose or this application for that.”

Ching sees a gradual shift in teachers' perceptions, but they face a number of challenges to using technology effectively in the classroom. For instance, according to Ching, one of the biggest challenges is schools' inability or unwillingness to allow students the freedom to use technology the way

they do outside of school. Often, access to the Internet itself is restricted for fear that students will see inappropriate content.

“Teachers are really caught in the middle,” said Ching. “They often face really constraining school policies that block things like YouTube, so they struggle to find workarounds.”

Meanwhile, most students have access to the latest tools and are left yawning at uses of technology in school that are often “ten years behind.”

“Tech for tech's sake is still a mindset for a lot of teachers, but students of this generation don't remember a time before information technology was a fact of life.”

– Cynthia Carter Ching

STEM

SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS



\$3.2 MILLION Grant to Study Formative Assessment in Mathematics

By Donna Justice

Professors Jamal Abedi, principal investigator, and Paul Heckman, co-investigator, received a five-year \$3.2 million dollar grant from the National Science Foundation. Work on “Formative Assessment in Mathematics: Current Status and Guidelines for Future Developments” began in September.

This research will increase understanding of the use of formative assessment in mathematics instruction in K-12. Formative assessment is intended to assess student knowledge and mastery during the teaching and learning process, enabling teachers to adjust their instruction to address


possible deficiencies in student understanding and mastery of particular concepts and problems.

The project’s focus on math stems from concern about persistently low statewide achievement in math compared with

the rest of the nation. The achievement gap for underrepresented students is even greater, particularly in math. The project will have three phases.

Phase I will consist of a statewide survey of K-12 mathematics teachers to identify current assessments and practices. In Phase II, based on the survey results, formative assessments at 120 schools with high percentages of underrepresented student populations will be analyzed for validity, reliability and accessibility, with particular attention paid to the needs of ethnically and economically underrepresented students, English learners, and students with disabilities. The researchers will also assess alignment with California content standards and measure the impact of formative assessment on student achievement on standardized state tests.

In Phase III, the researchers will select a group of schools with strong formative assessment practices and academic growth for in-depth, focused qualitative case studies to explore and document best practices. Ultimately, the project will produce conclusions, recommendations, guidelines and tools for the development and use of new or improved formative assessment instruments.

According to Abedi, the products and recommended best practices that will come out of this research have broad potential to improve student achievement outcomes, particularly for traditionally marginalized students. Lessons learned will be applicable nationwide and across academic subjects. 



Paul Heckman and Jamal Abedi

PROVIDING SCHOLARSHIPS and a Pipeline for More Math and Science Teachers

By Donna Justice

The Geology and Physics departments at UC Davis, in collaboration with the School of Education, received two recent grants to strengthen the campus’s ability to prepare more math and science teachers for California.

The Physics Teacher Education Coalition awarded a three-year \$300,000 grant to develop a model program to recruit more students into physics education and prepare more physics teachers. The NSF-funded Robert Noyce Teacher Scholarship Program provides \$1.2 million to support undergraduate and credential students who are pursuing math-

ematics and science teaching credentials. Geology professor Howard Day, the director of the UC Davis Mathematics and Science Teaching (MAST) Program, is the lead on the NSF grant. Along with Day, physics professors David Webb and Warren Pickett are the lead faculty on the physics education grant.

In 2004, the University of California campuses pledged to increase the number of new science and math teachers it prepares for California classrooms through its California Teach

continued on page 13



PROFESSOR RECEIVES GRANT to Improve Mathematics Teaching and Learning

By Donna Justice

Professor Rebecca Ambrose received a four-year grant for \$525,000 from the California Postsecondary Education Commission (CPEC) to strengthen mathematics teaching and learning in an elementary school district in North Sacramento.

Building on an earlier collaboration with K-2 teachers in the district also funded by CPEC, Ambrose and a team of researchers and educators from UC Davis, the Sacramento County Office of Education, and Robla School District will provide professional development to kindergarten through sixth grade mathematics teachers throughout the district to deepen their understanding of mathematics and improve their students' academic performance.

By giving teachers a venue for sharing their expertise with one another, the project will help teachers sharpen their skills in mathematics teaching. The teachers watch videotapes of one another's students solving problems and listen to audio tapes recorded in their classroom to examine the many different ways that children solve problems and the challenges that arise when students try to communicate about their mathematical thinking.


"By focusing teachers on mathematical explanation and problem solving, teachers gain a deeper understanding of the mathematics they teach and are able to explain it with clarity," said Ambrose. "We chose an emphasis on explanation because explanations promote mathematical learning for both the explainer and his classmates. Explainers benefit from the additional cognitive processing that explanations require and listeners benefit from hearing explanations in more familiar vernacular."

This is particularly important in the Robla district, where a large number of students are English learners who often struggle with complex word problems and where the district recently adopted a new mathematics textbook that emphasizes word problems and mathematical explanation. Professor Robert Bayley, one of the collaborators on the project, will

help the teachers consider the linguistic demands of story problems in their text and on standardized tests, so they can better prepare their English learners to make sense of these problems.

The professional development initiative is unique because rarely are programs able to use examples involving children in the classrooms where the teachers work. In addition, the project has an archive of videotape of children from the district going back three years. Some of the children who are now in third grade have been videotaped solving problems for the past three years. "They are our math stars, and the teachers learn a lot from watching them work," said Ambrose. "We look forward to continuing to follow their progress and hope they will inspire the teachers to build on the success of their colleagues in facilitating children's

problem-solving abilities."

"We have seen in our earlier work that by sharing their experiences and observing their students' growing understanding of math, teachers begin to experience collective efficacy," said Ambrose. Once individuals in the group see the success of their peers, they are more likely to feel successful and continue their efforts to work with each other and their students to strengthen mathematical reasoning and performance. 

"By focusing teachers on mathematical explanation and problem solving, teachers gain a deeper understanding of the mathematics they teach and are able to explain it with clarity."

– Rebecca Ambrose



A NOVEL APPROACH TO ALGEBRA: Equal Parts Math and Social Justice

By Donna Justice

Wendy Gallimore wants to be sure her fifth and sixth grade students are ready for algebra. She knows all too well the importance of this gatekeeper course and the obstacles her students face academically if they cannot master algebra.

“Many students who struggle in math get tracked into remedial classes and never can get out of that track,” said Wendy Gallimore, a teacher at Allison Elementary in Sacramento. “Our project is an attempt to get students to excel at math, have the ability to be in the college prep track for math, and have the whole world of possibilities open to them.”

Nearly 30 percent of students at Allison Elementary are English learners, and 87 percent are low income. Statistics nationwide for similar student populations are not encouraging when looking at algebra completion and college readiness.

So, when Gallimore learned about a novel program that combines a focus on math achievement and social justice—the Algebra Project—she decided she would give it a shot at her school.

Founded in 1982 by Robert Moses, the Algebra Project, Inc. is a national, nonprofit organization that uses mathematics as an organizing tool to ensure quality public school education for every child in America. Moses argues that “every child has a right to a quality education to succeed in this technology-based society and to exercise full citizenship.”

With support from the School’s CRESS Center, Twin Rivers Unified School District and the California Teachers Association Institute for Teaching (IFT), Gallimore adapted lessons from the Algebra Project and aligned them with the district’s math program. The project is now in the second year as a pilot under evaluation by the CRESS Center.

“We believe that school reform is best nurtured when it is teacher driven,” said Marlene Bell, alumna of the School of Education and IFT’s Algebra Project Director.

“Our students are learning about 40 percent of Algebra I standards in fifth and sixth grade. This has come through the integration of the district’s math curriculum (enVision math), the Algebra Project curriculum and state standards in math. It really has benefitted the students in their academic lives. They have learned to work in groups and are learning to see math as a tool rather than as a torture system,” said Gallimore.

The Algebra Project focuses on encouraging active learning of mathematical concepts by engaging students in relevant

continued on page 13



Wendy Gallimore (standing right) and MA student Christine Jang talk with students about a math problem they are trying to solve together.



Innovating SCIENCE Education through Model-Based Reasoning

By Donna Justice and Heidi Sciutto

A fundamental goal of scientists is to develop explanatory models that can account for various natural phenomena. Unfortunately, students in science classes are rarely given the opportunity to develop models; rather they are told the facts and asked to memorize them.

But science education professor Cindy Passmore and a team of researchers have a plan to help teachers learn how to apply “model-based reasoning” in the science classroom to create a learning environment that more closely resembles how scientists work.

In 2007, armed with a \$1.75 million grant from the National Science Foundation, Passmore and her colleague Arthur Beauchamp, director of the Sacramento Area Science Project, launched a four-year professional development program for a select group of middle and high school science teachers.

Known as Innovations in Science Instruction through Modeling (ISIM), the program has been up and running for three years, with the first cohort of teachers starting in 2007 and the second cohort in 2009. Participants attend summer institutes, conduct classroom-based research, and focus on lesson study and reflection.

Already, the researchers are recording positive impacts on both the teachers’ understanding and application of model-based reasoning and on students’ thinking about science.

“Especially for teachers who were already using a number of good teaching approaches, the lesson designs for the first cohort improved as compared to their pre-ISIM training,” said Passmore, who defines “good teaching approaches” as having students engaged in critical thinking and lessons that are designed to elicit students’ prior knowledge.

“Fundamentally we are trying to evaluate the extent to which teachers have effectively applied model-based reasoning (MBR) in their instruction,” said Passmore. “Each participant brings their particular sets of beliefs and goals about teaching that together influence the degree to which their lessons reflect MBR design.”

For instance, one teacher moved away from having students simply explain what was happening with the scientific

phenomena under investigation to why the phenomena occurs, which requires a much deeper understanding of the science at hand.

Another ISIM participant noted, “I have always thought that science education should produce critical thinkers and problem solvers, but after this past year, I have realized that the traditional way of teaching just doesn’t do this.”

But Passmore found that teachers face multiple barriers to adopting model-based reasoning. “It is important for us to identify these barriers (14 in all) so that we can design professional development that acknowledges and addresses them in ways that empower teachers to apply what they have learned. Among the 14 barriers, the most cited were lack of time and perceived need to cover particular standards or content.” One teacher noted, “I have to bravely accept that in trying to implement MBR, initially I may not cover all of the standards and I have to be willing to accept criticism and consequences.”

Based on their experiences with the first cohort, the ISIM team tried a “design experiment” to modify their approach with the second cohort. This group was given a particular lesson that they all tried in their classrooms—a Black Box experiment—providing them with a common experience.

The ISIM team found this more structured and uniformed modeling experience helped the teachers be more successful. The teachers, in turn, noted their students are “engaging with science at deeper levels, using critical analysis and thinking, and acting like scientists by looking for patterns,” said Beauchamp.

The critical component during this lesson, Beauchamp said, is that the students view their teacher as a co-explorer rather than the one providing the answers. “There is an emphasis on the exploration of ideas and dialogue to increase their understanding,” said Beauchamp. 📖

The ISIM research team includes Wendell Potter, professor emeritus in physics; Judi Kusnick, professor of geology at Sacramento State University; Rich Hedman, interim director of the Center for Mathematics & Science Education at Sacramento State University and co-director of the Sacramento Area Science Project; Connie Hvidsten and Lin Xiang, PhD students; and Patrick Dowd, a postdoctoral researcher at UC Davis.



STEM

SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS

SUMMER RESIDENTIAL PROGRAM

Turns High School Students into Researchers

By Donna Justice

If you want to get a student excited about science, put them in a lab and have them “do” science. That’s the philosophy behind the School of Education’s Young Scholars Program, a program started nearly 50 years ago with a grant from the National Science Foundation.

While many high school students spend their summers playing video games or maybe working at the nearest mall, up to 40 high school students spend six weeks every summer at UC Davis conducting real-world research in the natural and biological sciences. Participants in the advanced residential science program work one-on-one with research faculty in state-of-the-art laboratories. Each student works on an individual project and prepares a journal quality paper and symposium presentation about their work.

“Students work under the direction of world-class researchers,” said Rick Pomeroy, program director and teacher educator. “In fact, these high school students are engaged in research that most college undergraduates don’t have an opportunity to do.”

“YSP was probably one of the best experiences I had during my high school years,” said Peony Wong, a junior specialist researcher working in the Molecular and Cellular Biology Department at UC Davis.

Wong, who participated in the YSP program in 2004, says her position is given to graduating undergraduates who have an advanced background in research. Wong graduated from UC Davis in 2009 with a major in biochemistry and molecular biology and worked for three years as an undergraduate with the professor under whom she did her YSP research.

The program, which is now self-supporting, immerses students in the entire college experience. During the first two weeks, participants attend lectures on recent developments in biology and natural sciences in the mornings and conduct lab science every afternoon. During the last four weeks of the program, students work full time in their labs. Students live in campus dormitories and take field trips every weekend.

“I really enjoyed working with professors and grad students, but also that I could spend time with students who had the same passion for science and high achievement,” said

Wong, who plans to pursue a graduate degree in veterinarian medicine or a PhD program. “YSP and working in research helped me decide what I wanted to pursue as an undergrad. I had preconceived conceptions of research being boring, but after being thrown into it for six weeks, I realized it was exciting.”

“I am really proud of the staying power of this program,” said Pomeroy. “Over the years we have worked with upwards of 2,000 students and have enjoyed decades-long partnerships with researchers from virtually every scientific field on campus. This last year, we received more applications than in any previous year, and the quality of the students’ work and reflections on the program just continue to astound me.”

In 2011, the program runs from June 19 – July 30. Applications are due by March 31, 2011. For more information, visit YSP’s website at ysp.ucdavis.edu

What Young Scholars Program (YSP) Participants have to say:

“Research is fun! I fell in love with working in the lab.”

“YSP treated us like real scientists and adults. We had a lot of time in the lab and a lot of freedom.”

“This experience opened my eyes and gave me hands-on experience for what the field is really like.”

“YSP exposed me to the ‘why’ of research.”

“I met some amazing people I will never forget... At the end of the program, we were all one huge family.”

“I always knew I was passionate about science, but YSP brought that passion to a whole new level.”

STEM

SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS



Researching Collaborative Problem-Solving in ALGEBRA

By Donna Justice

Algebra is a gatekeeper. Study after study indicates that if a child does not master algebra by at least the ninth grade, he is far less likely to complete the rigorous courses required for college admission. Far too many never get through the gate.

Tobin White, assistant professor of mathematics education, believes collaboration and communication are keys to unlocking the mysteries of math for students.

“If students work together on a problem, talk aloud about their thinking, they’re more able to monitor the way they are thinking about a problem and to identify and correct their own errors,” said White, who is investigating how collaborative problem-solving among students using classroom networks of Texas Instruments graphing calculators can support learning in algebra.

“Self-awareness and awareness of others’ perspectives can open up a student’s thinking and lead him or her to attempt a different solution,” he explained.

White’s learning activity designs begin with a few related pieces of common mathematical objects, such as the two sides of an algebraic equation or three different ways of representing the same function. He uses a classroom computer network to share those elements among collaborating students’ calculators, turning the concepts into contexts for small groups of two or three students to work on and talk about in relation to real problems.

“The idea is to make concepts in math visible, accessible and dynamic by putting them at the center of the interactions among kids,” said Tobin.

With a \$650,000 grant from the National Science Foundation—a prestigious Faculty Early Career Development (CAREER) Program grant—White has been investigating whether this approach can provide students with a deeper understanding of algebra.

Last year, White and a team of graduate student researchers spent two to four days each week at West Sacramento Early College Prep, a charter school managed through a partnership among the School of Education, Sacramento City College and Washington Unified School District.

Working in a classroom that became known as the “Numbers Lab,” White and his team guided middle school and high school students through collaborative problem-solving

activities. Because the structure of the school is unconventional, allowing students to work in mixed-grade groups and pursue special projects in the core subjects, students were free to attend Numbers Lab sessions throughout the day.

“This enabled us to create a very different kind of math classroom from the kind you might expect to find in a more conventional setting,” said White. “We are challenging traditional ways of teaching and learning math, so West Sac Prep is the perfect setting for putting our designs into practice.”

Ultimately, White strives to design STEM classrooms that better resemble STEM workplaces. “They are interactive, collaborative, focused on authentic problems and questions, and are richly supported by new digital tools and literacies,” said White.

In the coming school year, White and his team will step away from their work at West Sac Prep to take their designs into mainstream high schools to investigate whether the collaborative technologies and techniques can work in more conventional classroom contexts.

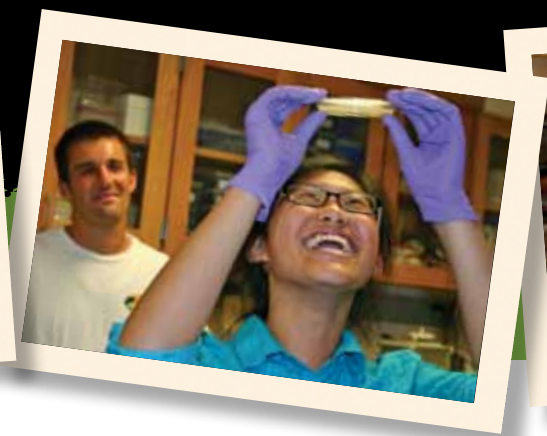
“I will alternate between the charter school and more traditional settings for the rest of the project [three years] as a strategy for striking a balance between what’s possible at a really innovative site and what’s feasible at sites that are more constrained,” said White. “Finding that balance is critical if this kind of work is going to have a broader impact on the way math is taught in secondary schools.”

What the Students at West Sacramento Early College Prep Had to Say about the Approach

“I liked being able to interact hands on with the math and with what we were doing instead of just the teacher writing on the board.”

“We focused a lot on experimenting... instead of the teacher just telling us how to do it.”

“I think I learn math better with another person. If I don’t understand one thing, I can ask her or if she doesn’t get something, she can ask me and we can help each other out.”



Providing Scholarships and a Pipeline for More Math and Science Teachers from page 7


program. This initiative encourages UC undergraduates interested in science, math or engineering to consider teaching as a career and creates courses to help them become great teachers. At UC Davis, the MAST program brings the School of Education together with physics and geology to provide courses, internships and mentoring to math and science majors interested in pursuing teaching after college.

Educators and policymakers have long agreed that the need for high-quality K-12 math and science teachers is great. California's need for a technically savvy workforce outstrips the number of high school graduates who pursue math and science in college and beyond. And very few math and science majors pursue teaching as a career. Even more concerning is the dismally small numbers of minority college students who enter math and science teaching careers.

"It is so important to increase the number of math and science teachers, especially underrepresented minorities," said

Barbara Goldman, associate director of the School's Teacher Education program. "Teachers in California need to be prepared to teach in diverse, high needs classrooms with a large proportion of English learners. Students in our schools deserve highly qualified teachers who understand their communities and are well prepared to help them succeed in the twenty-first century."

As a result of the PhysTech and Noyce grants, MAST aims to increase by at least 50 percent the number of math and science credential students in the School's teacher education program and to retain more than 80 percent of new credential teachers in their districts for four or more years.

For more information on MAST or our Teacher Credential program, visit the web at mast.ucdavis.edu and teach.ucdavis.edu. 

A Novel Approach to Algebra from page 9

activities that demonstrate the day-to-day uses of math. For instance, field trips put children in real world situations where they can apply mathematical concepts, such as applying the concept of positive and negative numbers by plotting out paths to and from different locations.


"Our program is unique. It combines math literacy with student advocacy around math," said Gallimore. "Students learn that it is okay to excel. They learn that together they will make it or not. They have learned skills that enable them to build themselves up in the classroom and out."

Engaging parents and the larger community are also important aspects of the program. At Allison Elementary, they hold Family Math Nights and an afterschool program for students in fourth through sixth grade. According to Gallimore, "Parents are learning to channel their desire for their children to succeed into a useful place that will help students be more successful in the long run."

"Having the students practice math in the real world and creating a space for families to be a part of the process can give children a lot of confidence," said math education professor Rebecca Ambrose. "Confidence and a willingness to try has a lot to do with success in mathematics."

Ambrose is so interested in how this program works that she has encouraged two of her MA students to conduct their research at Allison.

"Community college, state college and UC should be an option for all students," said Gallimore. "According to Bob Moses, students should be prepared to attend. Then we need to give them the dream that college is a real possibility. I'd like to think this is exactly what we are doing for our students."

For more on the Algebra Project at Allison Elementary, visit the web at www.teacherdrivenchange.org 

CALIFORNIA AFTERSCHOOL NETWORK

Launches New STEM Initiative

By Renee Newton

The California Afterschool Network, housed in the School of Education's CRESS Center, is launching a new initiative: "Advancing California's Capacity to Leverage Out of School Time Systems to Deliver High-Impact STEM Programming." With support from the Bechtel Foundation and the Noyce Foundation, the initiative will lay the groundwork to create and implement a robust statewide system that can deliver high quality STEM experiences during out-of-school time to more than one million students in California and support the 40,000 out-of-school-time professionals who serve them.

Over the course of the next 10 months, the Network and its partners, including UC Berkeley Lawrence Hall of Science and UC Irvine education and engineering faculty, will engage in the preliminary planning stages to prepare for a statewide effort to integrate STEM in California's out-of-school-time programs. Key components of the planning stage include:

- Developing a strategic plan for networking and scaling up STEM in out-of-school-time programs statewide, including developing an infrastructure and delivery system for supporting high quality STEM programming in major regions throughout the state.
- Creating regional STEM Innovation Centers to support out-of-school-time programs with curriculum selection, staff professional development, communications tools, and,


where appropriate, alignment with K-12 science efforts. Three centers in representative regions will be selected during the planning phase.

- Developing an evaluation approach and instruments to measure impacts on young people.

The statewide effort will be led by the California Afterschool Network in conjunction with the newly created California STEM Learning Network, a nonprofit organization committed to advancing STEM education and innovation in California.

Andee Press-Dawson, executive director of the California Afterschool Network, said, "This is an exciting opportunity to engage potentially millions of California students in science and math content that helps to propel them as international leaders based on their problem-solving skills."

Press-Dawson has convened a collaborative group of organizations that will undertake the planning effort and that will eventually lead to full implementation of the initiative's ambitious goals. She believes that "the Network's STEM initiative represents a unique and unparalleled statewide collaborative effort for bringing to scale the integration of STEM in California's out-of-school time programs."

Together, the Bechtel and Noyce Foundations provided \$406,785 in grants to support this effort. 

Director of SCIENCE PROJECT Leads

Effort to Create Framework for Science Literacy

By Heidi Sciuotto

Arthur Beauchamp, director of the Sacramento Area Science Project (SASP), is nearing the end of a five-year project, culminating in December with the publication of *Success in Science Through Talking, Reading, and Writing*. The joint project, funded by the California Postsecondary Education Commission (CPEC), includes Judi Kusnick of Sacramento State and Rick McCallum of UC Berkeley. The team presented their findings at the recent National Science Education Leadership Association (NSELA) 2010 Summer Leadership Institute.

The project focused on developing a science literacy framework, which addresses ways to integrate discussion, reading and writing in science instruction. Beauchamp noted that a number of other California Science Project sites have already been securing grants to implement the science literacy framework across the state.

"Because of advances in science education research and knowledge, we have a more robust body of knowledge that we can now draw upon," said Beauchamp. "We have a much greater foundation to build on than we did 15 years ago."

SASP Summer Institutes

Over the summer, SASP provided two professional development institutes for junior high and high school science



Science teachers work together during a SASP summer institute.

continued on page 15

TEACHER RESEARCH ACADEMY Making a Difference for Science Teachers

By Donna Justice

The professional development that teachers receive through the Teacher Research Academy at the Edward Teller Education Center (ETEC) has had a positive impact, according to a study now under way by Jamal Abedi, a professor of education.




A teacher who attended ETEC's Teacher Research Academy shows another teacher research she conducted at Lawrence Livermore National Laboratory.

ETEC, a collaborative of the Lawrence Livermore National Laboratory and the UC Davis School of Education, established the Teacher Research Academy in 2003. The Academy provides K-14 science educators from throughout Northern and Central California with professional development in biotechnology, biophotonics, fusion and astrophysics, and energy technologies.

Through the Academy, teachers are placed in the National Lab to perform cutting-edge research under the mentorship of scientists and to learn how to translate their discoveries into real-world science for the classroom. The intention is to increase teachers' content knowledge and confidence in making science meaningful for their students.

Abedi and his research team are surveying and interviewing Teacher Research Academy participants, a control group of teachers in other professional development programs and the students of both sets of educators.

"They organize their classrooms in much better ways than before," Abedi said of the teachers. "They think of their classes more positively. They feel the training sessions have helped them improve their knowledge."

In the coming year, Abedi and his team will focus on evaluating information about student performance as a final indicator of the success of ETEC's Teacher Research Academy. 

Science Project from page 14


teachers. The Science Instruction Institutes ran for five days concurrently, with an opportunity for the different grade level teachers—mainly from the Sacramento City Unified School District—to talk together and coordinate teaching practices for their students as they transition from junior high to high school.

The two institutes helped teachers focus on how to assess their students—aside from the usual multiple-choice test—in a way that informs teachers about student thinking. Building on strategies from Page Keeley's work, *Science Formative Assessment*, teachers learned how to use or adapt techniques to promote student thinking, uncover students' ideas, and use information about their students' progress in learning to improve their own instruction. Varied assessment techniques might include responding to an intriguing prompt, producing diagrams, annotated drawings, models, written argumentation, written explanations and classroom discourse.

Powerhouse Science Center Coming to Sacramento

A consortium of educators, policymakers, business and community leaders has been working to create and build the Powerhouse Science Center in the historic PG&E power station on the Sacramento River. "This will rival the Bay Area's Exploratorium," said Beauchamp. "It's really a value added project for Sacramento and STEM education in the region."

Over 20 partners are involved in expanding and relocating the current Discovery Museum Space & Science Center to serve as a premier science education center, tourist destination, community gathering place, and major event venue. SASP consults on a variety of activities and approaches for the future center and is looking to partner with the Discovery Museum on innovative programs.

For more information, visit powerhousesciencecenter.org/. 

THE CAMPAIGN FOR UC DAVIS: Ensuring a Strong Foundation for Bold Vision



Photo by Julie Ann Estaley/UC Davis



Various representatives were on hand during Chancellor Linda Katehi’s campaign announcement to the media, including (front row, second from left) sixth grade teacher José Bermúdez (Credential ‘06, MA ‘07) and his student Kristofer of César Chávez Elementary School in Davis.

On October 22, 2010, UC Davis marked a significant milestone in publicly announcing its first comprehensive fundraising campaign, with a goal of \$1 billion in philanthropic support from 100,000 donors. Nearly \$600 million has been raised from more than 72,000 donors to date, putting us on track to meet this ambitious goal. We are joining the best universities in the country in realizing this kind of investment from people who believe in the work we are doing.

“At the School of Education, we are working to put a great teacher in every classroom, to change the system, to find new ways to engage kids in learning, and to prove that we can catalyze and participate in making a difference for kids, teachers, families and communities,” said Harold Levine, dean. “With your support, we will achieve our goals.”

We invite you to join us. Every gift you make to the School of Education will contribute to the success of the Campaign for UC Davis. Thank you for what you have already contributed and what you may consider doing during the campaign and beyond. To learn more, visit education.ucdavis.edu/giving or giving.ucdavis.edu.

SHIELDS SOCIETY Celebrates Education

The Peter J. and Carolee W. Shields Society, which recognizes the thoughtful generosity of those who have made planned gifts—regardless of their size—to UC Davis, featured the School of Education during its annual recognition brunch program. Dean Harold Levine, Assistant Professor Tobin White, doctoral students Matt Wallace and Scot Sutherland, and Principal Yolanda Falkenberg demonstrated how a project-based learning approach is empowering underserved students at West Sacramento Early College Prep Charter School.

Ken Gelatt and Sandi Redenbach enjoyed the Shields Society recognition brunch in September. They are the first to make a planned gift to the School of Education.



Photo by Tony Novelski/Axion Photo & Design

Thank You

From the earliest stages of our development as a campus, philanthropy has played an important role in our ability to make a lasting contribution to the things that matter to all of us. We at the School thank our donors and honor their contributions.

Endowed Funds

These generous donors established permanent funds, the income from which supports our programs, faculty and students in perpetuity.

Anonymous

to establish two endowed funds for program and student support

Marcia & Mark Cary

to establish the Mark Cary Reflective Learner Award

Family & Friends of Brad Davis

to establish the Brad Davis – Alpha Gamma Rho Fellowship Fund

Dolly & David Fiddymment

to establish the Dolly & David Fiddymment Chair in Teacher Education

Nancy & Thomas Patten

to establish the Farrer/Patten Award in Teacher Education

Sandi Redenbach

to establish the Sandi Redenbach Students At Promise Award

School of Education Board of Advisors and Annual Fund Donors

to establish the Meg Stallard Leadership Fund

Susan Schnitzer

to establish the Susan Schnitzer Fellowship in Teacher Education

Children's Center at Sutter Medical Center

to establish the Words Take Wing Endowment

Corporations, Foundations, and Associations

We value the endorsement of our mission by the following organizations.

Amgen Foundation
Annie's Homegrown
Anonymous
Association for Institutional Research
AT&T
BayBio
Big Books By George
The Boyd Family Foundation;
Mary Ann and Lou Peoples, trustees
California County Superintendents Educational Services Association
California Endowment
California Retired Teachers Association
California Teachers Association
Capstone Press
Charles Stewart Mott Foundation
Children's Center at Sutter Medical Center, Sacramento
S.H. Cowell Foundation
Education Graduate Student Association
ExxonMobil Foundation
Foundation Consortium for California's Children and Youth
Foundation for Child Development
Bill and Melinda Gates Foundation
William T. Grant Foundation
Evelyn and Walter Haas Jr. Fund
Heinemann Raintree Publishers
William and Flora Hewlett Foundation
Intel
James Irvine Foundation
Isabel Foundation
Johnson & Johnson
Walter S. Johnson Foundation
Kiwans Club of Davis
Lawrence Livermore National Security
National Academy of Education

National Council for Community and Education Partnerships
Norwood House Press
Oracle Corporation
David & Lucile Packard Foundation
Primary Concepts
Project Dream, Inc.
The Robert Browne Foundation Inc.
Rockefeller Foundation
Sacramento Area Library Organization
Scholastic, Inc.
Sierra Health Foundation
Stuart Foundation
Target
Tri-Valley Community Foundation
UC Davis Children's Hospital
Union Bank of California Foundation
Unitarian Universalist Church of Davis
United Way California Capital Region
Woodland Reveille Lions Club
Woodland Sunrise Rotary Foundation
Woodrow Wilson National Fellowship Foundation

Dean's Leadership Council

Dean's Leadership Council members support the School with their gifts of \$1,000 or more, including planned gifts made through estate plans.

Mrudula & Mayur Amin
Anonymous
Patricia & Jorge Ayala
Marlene Bell
Judith Blum
Jan & Davis Campbell
Marcia & Mark Cary
Lois & Herb Cross
Susan & J. Rodney Davis
Beverly & Mitchel Efishoff
Diane Fiddymment
Dolly & David Fiddymment
Margaret Fortune

Carol & Rick Fowler
Marjorie Solomon Friedman & Mark Friedman
Joanne Galli-Banducci & Michael Banducci
Augustine Gallego
Ken Gelatt & Sandi Redenbach
Elizabeth Gibson
Deborah & Dave Gordon
Mohini Jain
Robert Kucer
Ann Mastergeorge & Harold Levine
Roberta & David Murphy
Diane & Jon Parro
Nancy & Thomas Patten
Mary Ann & Lou Peoples, The Boyd Family Foundation
Nancy & James Pollock
Ann & Craig Pridgen
Jeanne Reaves
Irma & Francisco Rodriguez
Susan Schnitzer
Carol & Hal Sconyers
Peggy Shannon
Tom & Meg Stallard
Mary Catherine & Thomas Swanson
Connie & Glen Thomas
Wendy & Lou Vismara

Faculty and Staff

Financial gifts from current and former School of Education faculty and staff reinforce their commitment to strengthening teaching and learning for all students.

Jamal Abedi
Rebecca Ambrose
Sarah Anderberg
Anonymous
Steve Athanases
Rose Bacchini
Allan Bellman
Terry Blake
Joanne Bookmyer
Karen Bray
Cynthia Carter Ching

continued on page 18

Marie Carter-Dubois
 Maria Casas
 Lori Dana
 Pam Davis
 Shawn DeArmond
 Sharon Dugdale
 Nancy Erbstein
 Larry Estes
 Joanne Galli-Banducci
 Barbara Goldman
 Kerry Hasa
 Paul Heckman
 Pauline Holmes
 Pamela Hutchison
 Donna Justice
 Anna Kato
 Corinne Kosmitzki
 Michele Leonard-Fortes
 Harold Levine
 Judy MacDonald
 Lee Martin
 Julie Maxwell-Jolly
 MaryAnn Mellor
 Al Mendle
 Barbara Merino
 Viki Montera
 Renee Newton
 Jon Parro
 Cindy Passmore
 Ann Pridgen
 Mary Reid
 Kim Reynolds
 Elizabeth Russell
 Mary Vixie Sandy
 Julius "Sass" Sassenrath
 Traci Schmidt
 Merry Sponsler-Jones
 Doreen Barcellona Strnad
 Cary Trexler
 Lisa Villarreal
 Dave Wampler
 Valerie Welch
 George Yonge
 Joan Zimmermann

Annual Fund

These gifts, received between July 1, 2009 and June 30, 2010, were made to the School of Education Fund, the New Teachers Fund, the School of Education Community Fund, and other funds supporting our people and programs. We are grateful to these hundreds of people who have joined with us in making a difference.

Kristeen Abrahamson
 Erin & Scott Allen
 Mitchell Alvarez
 Rebecca Ambrose, Ph.D. & Alec Winters
 Esther & Juan Amezcua
 James Anderson
 Gale Andrews & Don Andrews, M.D.
 Anonymous
 Caryn & Gary Ball
 Caroline & Mark Bauhaus
 Tracy & Andrew Bebb
 Janet Beck
 Marlene Bell & Robert Bell, Jr.
 Allan Bellman, Ph.D.
 Linda Binning
 Teresa & Randall Blake
 Judith Blum
 Kelly & Peter Bolton
 Judy Boock Davis & R. Michael Davis
 Julia Brootkowski
 John Brown, USAF Ret.
 Kimberly Brown
 Teresa Bulich
 Billie & William Butler
 Gary Campbell & Sharon Lewis
 Jan Campbell & The Honorable Davis W. Campbell, III
 Linda & Aaron Campbell
 Jennifer Cardone & MaryAnn Mellor
 Marie Carter-Dubois & Jason Carter, D.D.S.
 Lloyd Chan
 Kathryn Chwaz
 Donna Cima
 Karen & Gilbert Clark
 Ann-Marie Clegg
 Mary & George Cole
 Petrelia Coleman-Brown
 Kristine Cordova & Matthew Cordova, Ph.D.
 Guy Cox
 Carol Cramer

Lois Cross & The Honorable Herbert Cross
 Beverly Culloden
 Peter Curren & Beverly McNeilly
 Mary Dal Porto & Michael Fulks, M.D.
 Dianne & Michael Davis
 Pam Davis
 Susan & J. Rodney Davis
 Lynne & W.S. De Bie
 Francesca DeFazio
 Rachel Defer
 Terri & Todd DeMitchell
 Debra De Paula
 Jennifer DiMaio-McCracken
 Lesley & Larry Dodson
 Malynda Dorsey
 Mary & Donald Douglas
 Christina Drane & Jerome Drane, Jr.
 Susan Dunlap & Vincent Dunlap, D.V.M.
 Susan & Jim Eakle
 Judith & Brent Edwards
 Martha & Douglas Edwards
 Yong Hee Eo
 Linda & Steve Ethier
 Cynthia & Ray Evans
 Sharon & Gary Ewbank
 Eric Ferrante
 Diane Fiddymont
 Dolly & David Fiddymont
 Jeanette & Michael Fitch
 Elizabeth & William Fleisig
 Colonel Richard Fowler, II
 Marjorie Solomon Friedman, Ph.D. & Mark Friedman
 Friends of the School of Education
 Lynne & Paul Fujitani
 Joanne Galli-Banducci & Michael Banducci
 Augustine Gallego
 Carolyn Garcelon, Ed.D. & Stephen Garcelon, D.D.S.
 Elizabeth & Kenneth Giannotti
 Diane & David Gilmer
 Mary & Wayne Ginsburg
 Barbara Goldman, Ph.D.
 Steve Gonzalez
 Deborah Gordon & The Honorable David Gordon
 Larry Gordon
 Antoinette & Albert Graham
 Amanda Gustafson & William Gustafson, Ph.D.
 Elizabeth & Douglas Hambright
 Susan Hamlin
 Clare Hampton
 Marilyn Hampton



Photo by TJ Ushing/UC Davis

Maggie Wunderlich (Credential '10, MA '11), 2010 Sandi Redenbach "Students At Promise" Awardee, 2010 Mabel Outler Scholar, California Retired Teachers Association, 2010 School of Education Faculty & Staff Awardee

Steven Harris
 Susan De Mille Harvey
 Kerry & Martin Hasa
 Heidi Heiman & Dennis Heiman, Ph.D.
 Barbara Hiura
 Leslie & Russell Hopper
 Jo Ann Houk
 Victor Huang
 Deborah Hutchings
 Shirley & William Ingram
 Glennie Jackson & John Jackson, Ed.D.
 Mohini Jain
 Donna & Dayton Johnson
 Melissa Johnson
 Cheryl & Jerry Jones
 Margaret & Curtis Jones
 Meghan Jones
 Judithann & George Judd
 Donna & Mark Justice
 Trinh Kabbabe
 Charlene & Richard Kalar
 Joseph Kaplan
 Anna & Dennis Kato
 Talmadge King, Jr., M.D.
 Vivian & Thomas Kirckof
 Corliss Krivoy & Michael Krivoy, D.V.M.
 Kristen Kulp, Ph.D. & Thomas Kulp

GIVING opportunities

School of Education Annual Fund – Help support our students, our research and our public service to benefit all.

For more information, go to education.ucdavis.edu/giving.

Velma & Ronald Lagerstrom
 Linda L’Ai &
 Wayne Wurtsbaugh, Ph.D.
 Sharon Langhart &
 Walter Langhart, Jr.
 Carolyn & Josh Latkin
 Diane & Steven Lee
 Michele Leonard-Fortes, Ph.D.
 Harold Levine, Ph.D. &
 Ann Mastergeorge, Ph.D.
 Victor Lim, O.D.
 Anne Lincoln & Steven Roth
 Brent Lindsay & Laticia Sims
 Lynn Logan
 Tommie & Jeremy Lukensmeyer
 Richard Luna
 Theresa & Robert Mac Kenzie
 Jean & Ashi Malik
 Mara Malone &
 John Malone, Jr. D.V.M.
 Nina Marshall &
 William Marshall, III
 Karen Martin
 Charlotte Matlock
 Christopher & Karen May
 Valentina & Marven Mays
 Marianne & William Mazotti
 Karen Mc Colloch
 Susan & Barry Mc Garry
 Carole & Donald McLain
 Barbara Merino, Ph.D. &
 Robert Poindexter
 Nancy Meyers &
 James Meyers, Ed.D.
 Michael Miller
 Stacy Miller
 Beatrice Minnis
 Douglas L. Minnis
 Julie & Robert Minnis
 Carol Mitchell-Ratliff &
 Kelly Ratliff
 Vicki & Paul Moering

Kay Morison, Ph.D. &
 James Morison, Ph.D.
 Susan & Richard Morris
 Roberta & David Murphy
 Karen Nelson &
 Thomas Nelson, D.Eng.
 Christine Olin &
 Dennis Olin, D.V.M.
 Kimberly Oxholm
 Janice Paquette
 Thomas Parker
 Diane & Jon Parro
 Janis Pennington
 Barbara Perkes
 Susan & Douglas Peyton
 Mollie & Michael Pieretti
 Marie-Louise & Mark Plimley
 Pamala Pritchard
 Amber & Benjamin Pryor
 Erica Raaberg
 Charlotte Rapport &
 David Rapport, Esq.
 Lana & Arthur Rasberry
 Dair Rausch &
 David Rausch, M.D.
 Jeanne Reaves
 Marianne & Michael Reay
 Sandi Redenbach & Ken Gelatt
 Mary Reid
 Felicia Rodoni
 Janet Roper
 Sharon & Elliott Rose
 Carol & Charles Salinas
 Gail Sangenitto
 Carol & David Sargent
 Doris Sassenrath &
 Julius Sassenrath, Ph.D.
 Kathleen Schinski
 Laura Schmidt
 Traci Schmidt
 Susan Schnitzer
 Armen Sedrakian

“I can’t count how many positive stories I have heard from my colleagues about students who made dramatic academic improvements, behavior changes, or socio-emotional growth. After a year of transitioning from student to teacher and back again, I finally feel propelled into not only a career, but a vocation. Thank you to all the donors for making this difficult, transformative, and inspiring year possible. We literally could not have done it without you.”

– Maggie Wunderlich (Credential ’10, MA ’11)

Aletha & Hugh Silcox
 Kathleen & Barton Simmons, Ph.D.
 Diane Siri & Frank Siri, Jr.
 Christine Souza
 Marilyn & Donald Spiegel
 Pamela Spycher, Ph.D.
 Tom & Meg Stallard
 Carol & Peter Storey
 Doreen Barcellona Strnad
 Ting Sun, Ph.D.
 Mary Catherine &
 Thomas Swanson
 Paula & Phillip Symonds
 Linda Taggard
 Linda & Marvin Talso
 Arline Thomas
 Julie & Jeffrey Thompson
 Lauren & Howard Tsztoo
 Lori Turk-Bicakci & Ara Bicakci
 Carole Vargas &
 Honesto Vargas, Jr.
 Gracemary Ventura
 Kathleen & Manuel Villarreal
 Dyana Vukovich
 Lois & Michael Wall
 Marjorie & Jack Wallace

Beate Wegge & Leon Wegge, Ph.D.
 Tanya Welch
 Cari & Brian Wise
 Patricia Wong
 Gwynn Woodhouse
 Ronald Wyrick, Ph.D.
 George Yonge, Ph.D.
 Elizabeth Young
 Nancy & Charles Zadra
 Mary & Gregory Zavala
 Joan & Matthias Zimmermann

The honor roll of Annual Fund donors reflects gifts to the School of Education between July 1, 2009 and June 30, 2010. We have made every effort to ensure that we have recognized our donors accurately and, to that end, would appreciate you contacting Jon Parro at (530) 754-7024 or jparro@ucdavis.edu with any corrections or questions.

Thank you very much!

In Appreciation Donors may make a gift to recognize someone who has made a difference. The following people have had gifts given in their honor or memory and we are pleased to be able to acknowledge them.

Hugh Black
 Dorothy Blackmore
 Dona Brandon
 Del Bryant
 Cal Crabill
 Jean Cutts
 Sue Davis
 Sharon Dugdale

Larry Estes
 Richard A. Figueroa
 Maryann Gatheral
 Burt Liebert
 Kenneth Lipfield
 Jack Lowry
 Joann McGrew
 Doug Minnis

Sandra Murphy
 Lawrence Newberry
 Jon Parro
 Victor Perkes
 Phyllis Ridling
 Kay Sain
 Jon Sandoval
 Julius “Sass” Sassenrath

Evelyn Silvia
 JoAn Skinner
 Carlton Spring, Jr.
 Leroy Troutner
 Henry Trueba
 Jon Wagner
 David Wampler
 George Yonge

(MAIL)

Upcoming **EVENTS**

Academic Literacy Summit

February 4, 2011
Activities and Recreation Center, UC Davis

Words Take Wing: Honoring Diversity in Children's Literature

Joyce Carol Thomas
February 9, 2010
10:30 a.m. Freeborn Hall
7 p.m. Buehler Alumni & Visitors Center
Tickets available at: tickets.ucdavis.edu

Second Annual Equity Summit

April 30, 2011
UC Davis Conference Center

Third Annual SAYS Summit

*Sacramento Area Youth Speaks
Summit and Poetry Slam*
May 13, 2011
UC Davis Freeborn Hall

School of Education Graduation

June 8, 2011
4 – 6 p.m.
Mondavi Center, UC Davis



Please consider a gift to the School of Education in support of our efforts to catalyze change in teaching and learning. education.ucdavis.edu/giving

Keep in Touch

Alumni and friends, please let us know about your accomplishments and other news by sending us updates at ed-alumni@ucdavis.edu



Post your thoughts and questions on the School's Facebook page.



twitter.com/UCDEducation

For more on these and other events, check the School's website at: education.ucdavis.edu