

Research Aims and Measures

*“Improving the mathematics learning of every child depends on making central the learning opportunities of our teachers. **Teachers cannot be expected to know or do what they have not had opportunities to learn.** This will require a deliberate and sustained focus on identifying the mathematics knowledge needed for teaching mathematics, on understanding its specific uses in teaching, and the careful development of well-designed and taught courses and workshops, materials and supports.”*

-Deborah Loewenberg Ball, University of Michigan, US Department of Education Summit on Mathematics, February 5, 2003.

ACTS targets the preparation and success of students in Algebra I, the gatekeeper to higher mathematics and college. The effect of professional development on teaching and the subsequent achievement of students are studied in a research design that includes:

- Comparison of teacher baseline knowledge and post ACTS intervention knowledge and use of mathematics and pedagogy.
- Assessment of the integrity of implementation of ACTS teaching strategies in the classroom.
- Assessment of the value added in the classroom by tracking the rate of student achievement growth in targeted and control (wait-listed) classrooms.
- Assessment of the value added by tracking the induction of new mathematics and science teachers.
- Case studies of teacher and school implementation within one school site.
- Assessment of benchmarks of systemic change for both UCR and JUSD.



Program Team

Principal Investigator:

Dr. Richard Cardullo, Professor of Biology

Co-Principal Investigators:

Dr. Kathleen Bocian, Research Director
Dr. Pamela Clute, Assistant Vice Provost
Academic Partnerships
Dr. DeWayne Mason, Educational Services,
Jurupa Unified School District
Dr. Michael Rettig, Professor of Chemistry

ACTS Director:

Shirley Roath

Evaluation:

Dr. Kimberly Hammond, Associate Professor of
Biology

Researchers:

Michael Bryant
Samantha Scribner



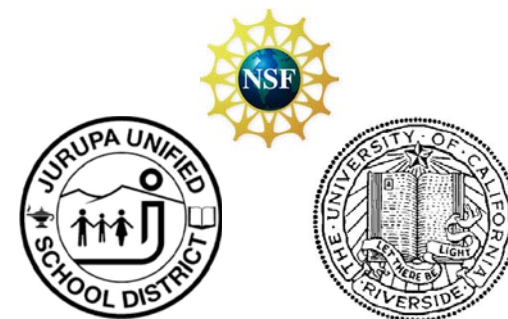
The **Alpha Center** offers an outreach infrastructure for the University of California Riverside campus through three activities:

- 1) Coordinating UCR activities under educational partnership funding,
- 2) Acting as a clearinghouse for information and current projects, and
- 3) Acting as a catalyst for future projects, such as the MSP Mathematical ACTS.

www.alphacenter.ucr.edu

Mathematical ACTS

Mathematical Achievement through Collaboration with Teachers and Students



National Science Foundation
Math Science Partnerships
EHR-0226948

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**University of California, Riverside
Jurupa Unified School District**

NSF Mathematical ACTS: Achievement through Collaboration with Teachers and Students

What Is Mathematical ACTS?

Mathematical ACTS is a multifaceted research project designed around specifically tailored initiatives for teachers and students in the 4th-9th grades. ACTS seeks to raise achievement and close achievement gaps in mathematics for all Jurupa students through a series of programs (150 hours annually) for teachers and students.



MATE: The Mathematics Academy for Teaching Excellence models exemplary teaching with explicit links to mathematics and science content and relevant connections to real-world applications. This summer institute provides teachers background research, opportunities to form school site teams, and extensive material resources to implement demonstrated lessons in the classroom.

CHAMP: Climbing Higher with the Academy for Mathematics Performance collaboratively creates, demonstrates, and tests innovative instructional strategies in mathematics. Students, teachers, and mathematical content from a selected grade level form the core of this weeklong lab school. Teachers work as participant observers, practice model lessons, and work in the role of peer coaches to validate the new instructional strategies designed to increase student conceptual understanding of mathematics.

ALIAS: Accelerated Literacy Integrating Algebra and Science provides university faculty who design and oversee science inquiry lessons for groups of teachers and their students. Hands on demonstrations and experiments reinforce standards in mathematics and language arts. Summer extensions of ALIAS provide teams of teachers and students with a weeklong experience at the University labs.



MATE, ALIAS, CHAMP FOLLOW-UP: Model demonstrations of lessons in mathematics connected with science for ACTS teacher participants with guided discussions and support for implementation of new strategies. Monthly meetings are held after school.

CLASSROOM SUPPORT: Mentoring, in class visits, guided discussion, and support for observations, implementation of strategies, peer coaching, and organizing school site change.

CTFMS: Community Teaching Fellowships in Mathematics and Science provides professional development, mentoring and financial support for college mathematics & science majors who want to become teachers. Fellows receive MATE and CHAMP training and are placed for 150 hours in a Jurupa classroom.

Summer Academies for Students: provide a variety of summer offerings for 4th – 9th grade students (Girls Excelling in Mathematics with Success, Healthy Body-Healthy Mind, Algebra Middle School Academy, College Going Academy). While standards based content is emphasized, the goal is to motivate students in mathematics and science through a broader perspective on these subjects.



Jurupa Unified School District Quick Facts: 16 elementary, 3 middle, 2 high schools: 20,500 students:

- 66.3% of students Free/Reduced Lunch
- 88.4% Fully Credentialed Teachers
- 32.1% English Language Learners

ACTS builds on a history of partnerships between JUSD and UCR in preservice and inservice development of teachers, research, and direct services to students. In 1997-1998, JUSD responded to California Standards in mathematics by creating district essential and extended standards with teams of teachers. These standards, quarterly standards referenced tests, and other staff development initiatives have led to significant gains in the percentage of students reaching mastery of district standards in grades K-6 during the past 5 years.