

The Impact of Sustained Professional Development on Student Achievement: El Centro, CA Case Study



NO CHILD LEFT BEHIND!



LEAVE NO CHILD BEHIND!



DON'T LET ANY CHILD FALL BEHIND!



NO CHILD SHALL GET BEHIND AND FAIL!



DON'T FAIL TO GET BEHIND YOUR CHILD!



DON'T FAIL, OR IT'S YOUR BEHIND!



IT ALL RUNS DOWNHILL...



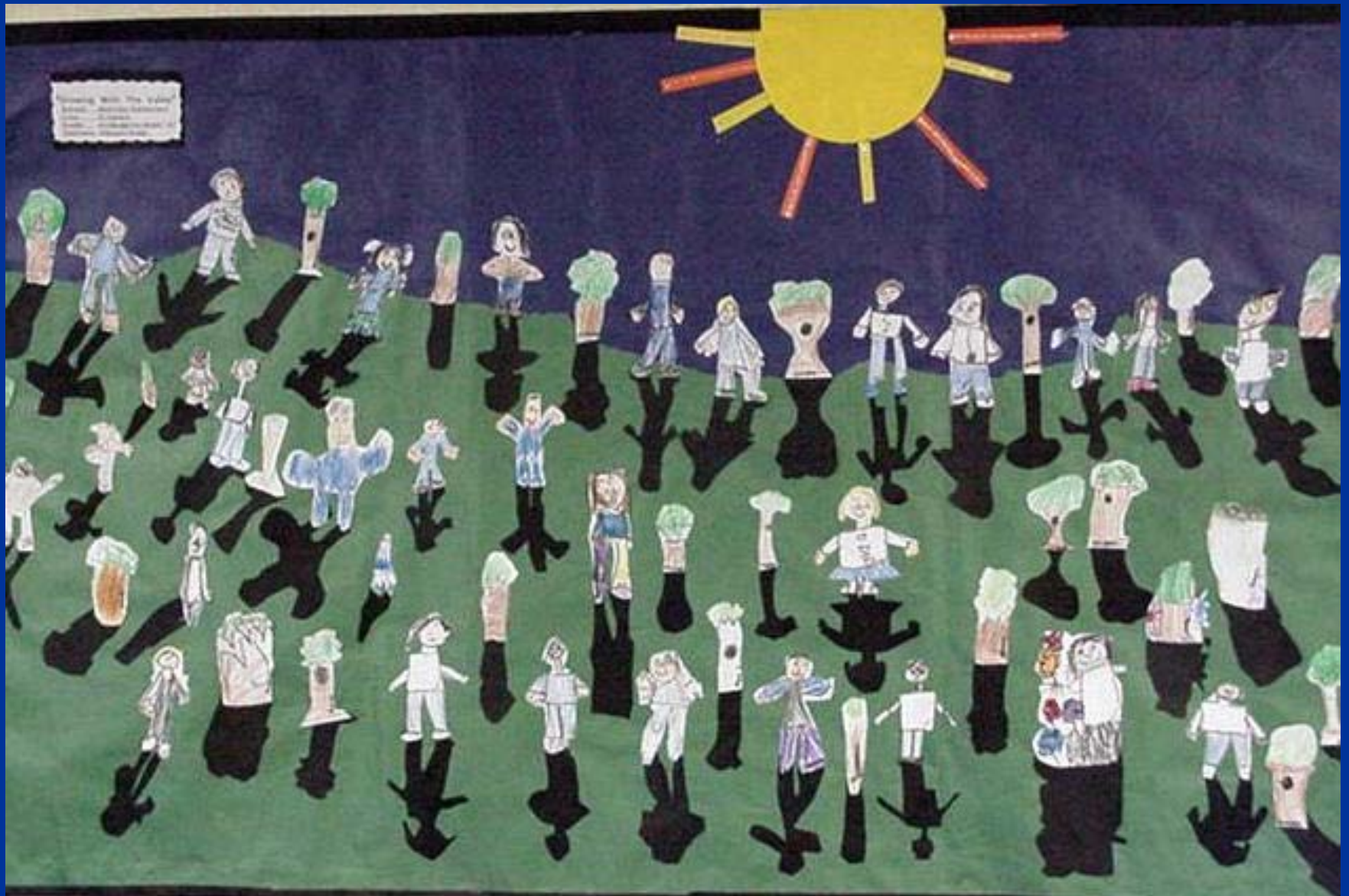
Case Study Critical Questions

- ◆ What is the context?
- ◆ What is the evidence?
- ◆ What is the infrastructure?
- ◆ What are the implications?

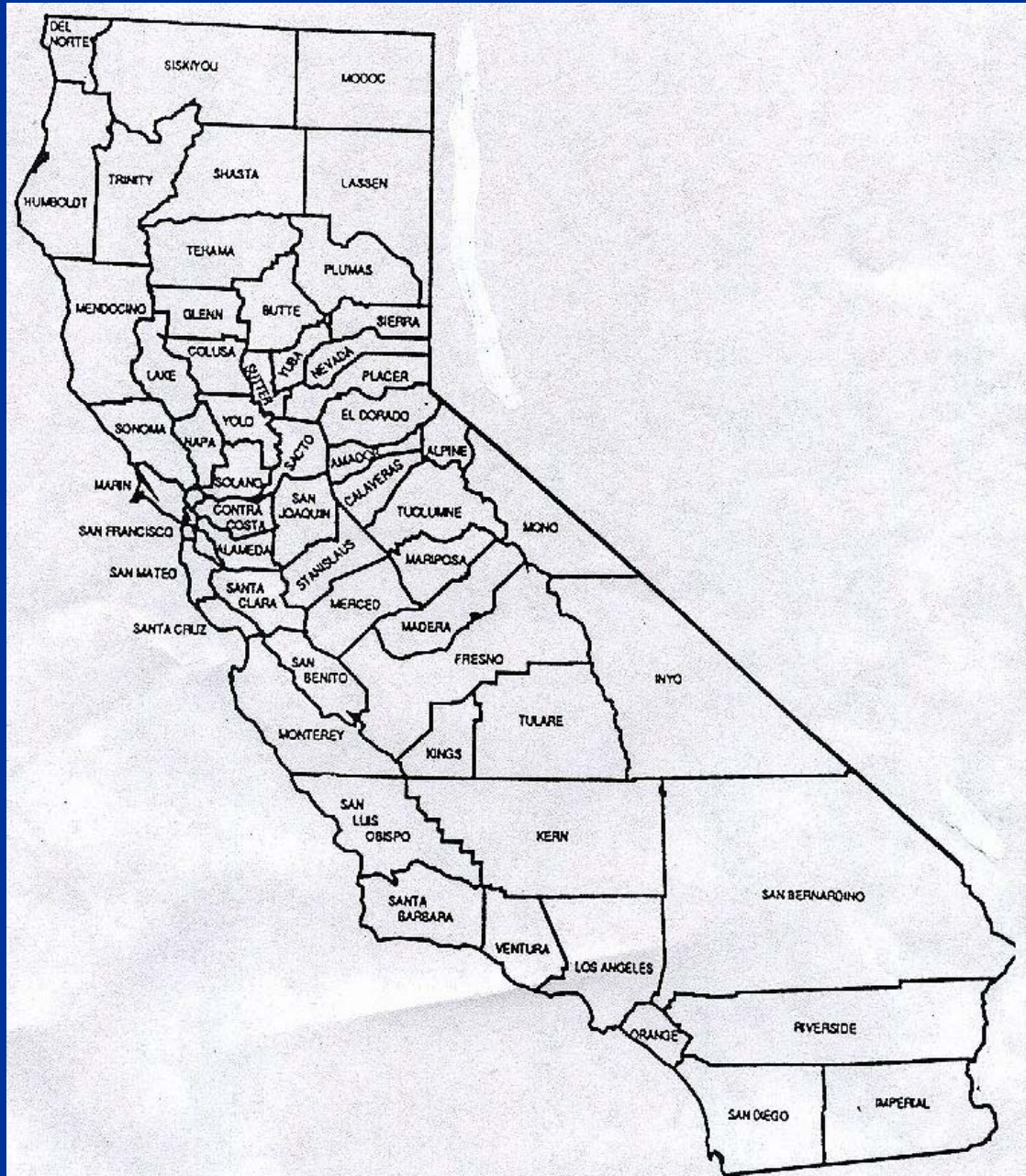
Context

- ◆ Need
- ◆ Our Region
- ◆ Our Community
- ◆ Our Students

A Field Trip to El Centro, California



Where is El Centro?



Our Community and Students

- ◆ Mean income \$16,322
- ◆ Poorest of all 58 counties in California
- ◆ 30% unemployment rate
- ◆ 36,000 students in 14 Districts

In El Centro

- ◆ 6,500 K-6 students
- ◆ 11 Title I, School-wide Project Schools
- ◆ 73% Free/Reduced Lunch
- ◆ 51% English Language Learners
- ◆ 10% Migrant
- ◆ 81% Hispanic, 12% Caucasian, 4% African-American, 3% Asian



Evidence

- ◆ SAT 9
- ◆ TIMSS Released Science

Assessment and Evaluation

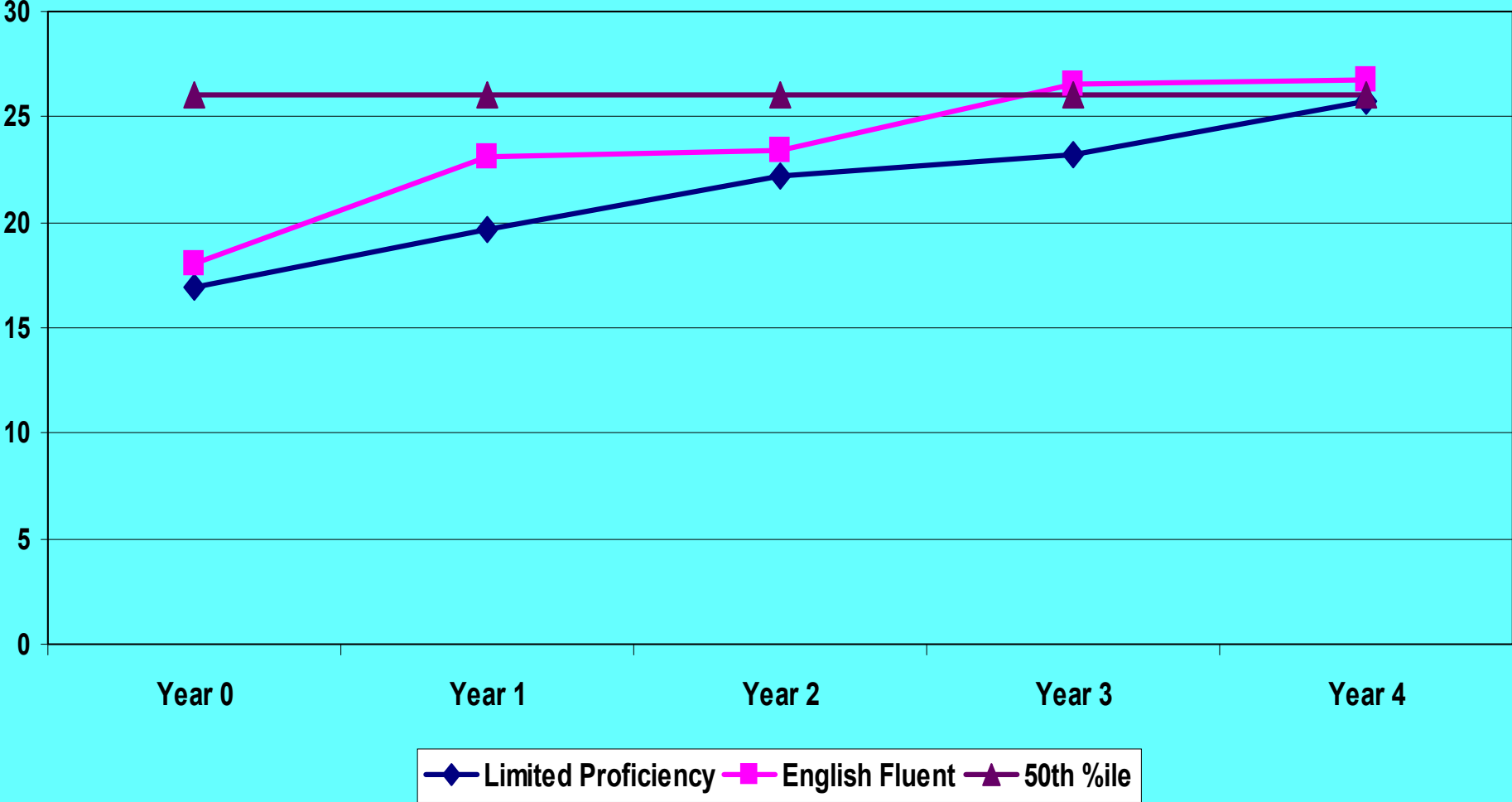
◆ Stanford Achievement Test: Science Scores

1998-99 NPR - Sorted by Years in Program

Years CUM	Gr4	Gr6
0	21 n=137	27 n=174
1	32 n =150	32 n=121
2	38 n=141	42 n=132
3	47 n=111	50 n=107
4	53 n=91	64 n=104

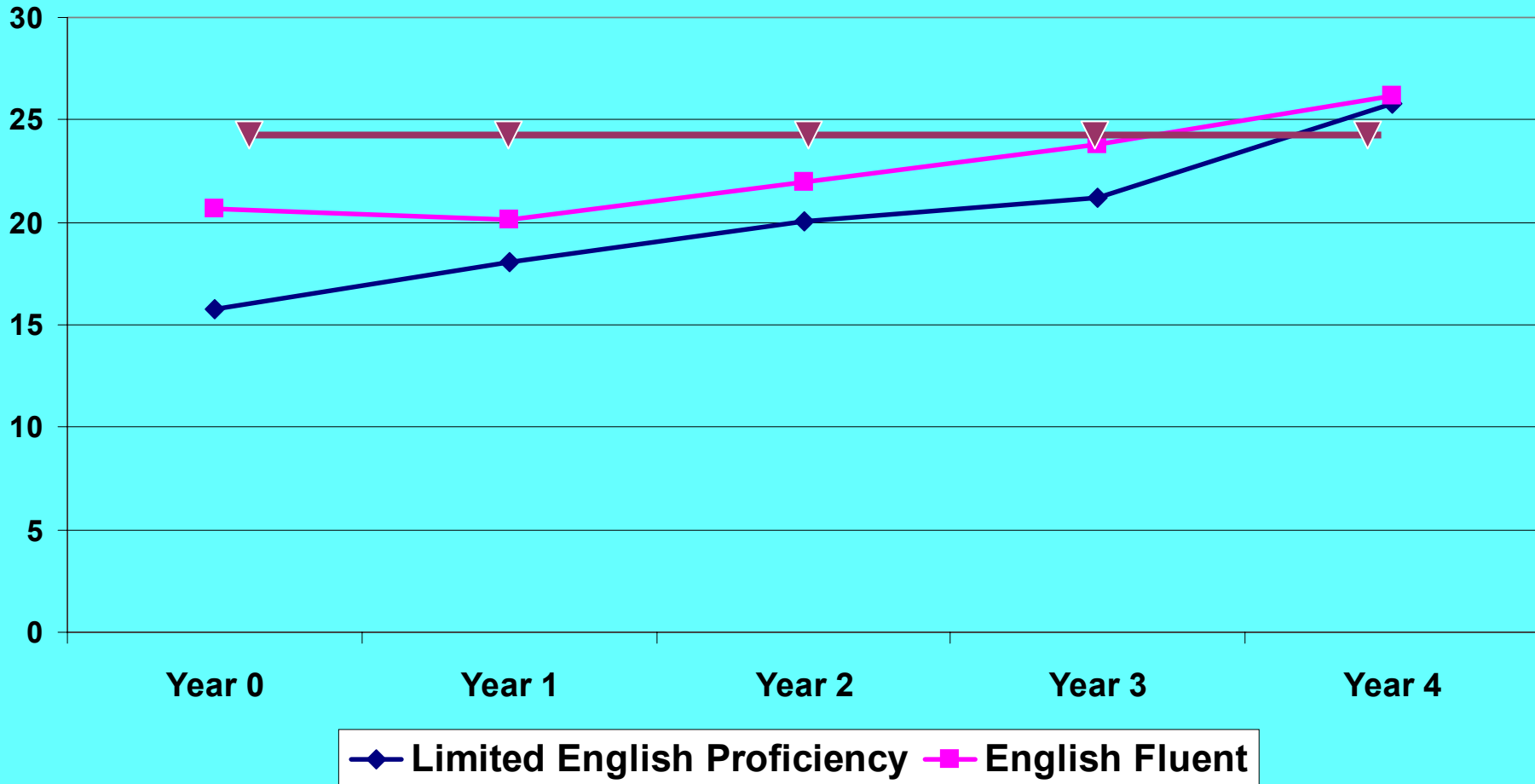
Evidence from Imperial County, CA

Science Raw Scores By English Proficiency Grade 4 - 1999



Evidence from Imperial County, CA

Science Raw Scores By English Language Proficiency 6th Grade 1999



Assessment and Evaluation

◆ TIMSS Released Multiple Choice: Science Scores

2000-2001 Mean Raw Scores- Sorted by Years in Program

Years CUM	Gr7	Gr8	Gr7/8
	9.4	11.1	10.2
0	8.7 n=48	10.0 n=107	9.5 n=155
1	8.9 n =136	10.5 n=103	9.7 n=239
2	9.0 n=168	10.7 n=112	9.8 n=280
3	10.4 n=125	11.1 n=90	10.7 n=215
4	11.0 n=84	13.3 n=93	12.7 n=177
	p<.023	p<.001	p<.01

Assessment and Evaluation

- ◆ TIMSS Released Multiple Choice: Science Scores
2000-2001 Mean Raw Scores- Sorted by Units Completed

Grade 7	Mean	SD
High (4+ units)	10.335	3.998
Low (3 or less units)	8.892	3.435

p<.001

Grade 8	Mean	SD
High (4+ units)	12.137	4.319
Low (3 or less units)	10.558	3.551

p<.001

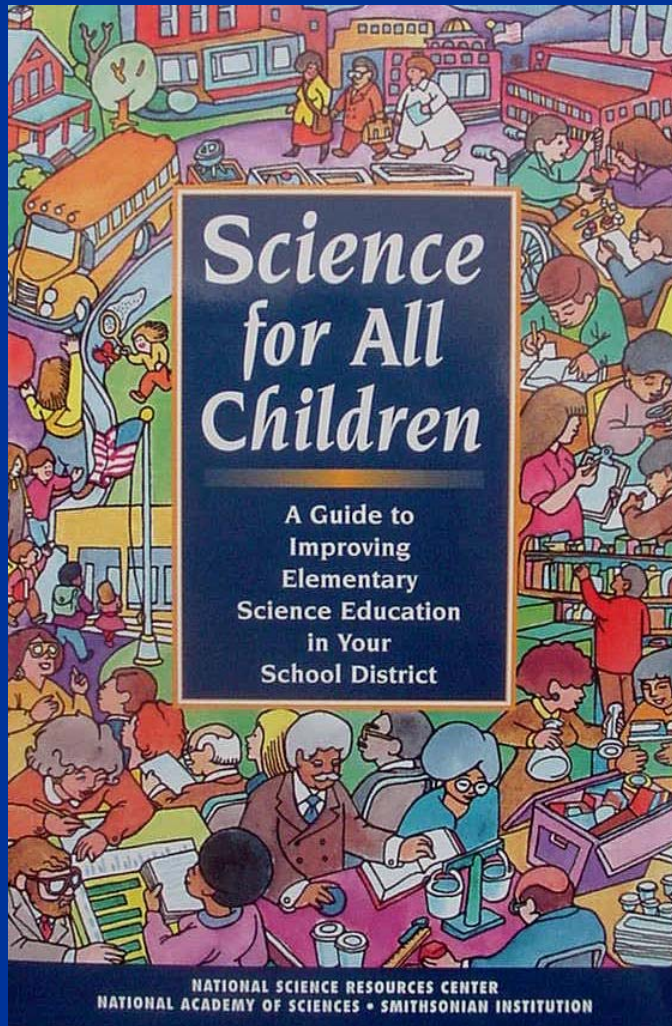
For additional information on this research



Amaral, O., Garrison, L. and Klentschy, M. (Summer 2002). Helping english learners increase achievement through inquiry-based science instruction. Bilingual Research Journal, 26:2, 213-239.

http://brj.asu.edu/content/vol26_no2/pdf/ART2.PDF

Five Critical Elements for Reform



- ◆ High Quality Curriculum
- ◆ Sustained Professional Development
- ◆ Materials Support
- ◆ Administrative and Community Support
- ◆ Assessment and Evaluation

ISSUES IN
SCIENCE
EDUCATION

SCIENCE TEACHER RETENTION

Mentoring and Renewal

Jack Rhoton & Patricia Bowers
National Science Education Leadership Association

NSTApress[®]
NATIONAL SCIENCE TEACHERS ASSOCIATION

“ Ten critical elements to consider when planning professional development programs for teachers with the intent of building a professional work-force...”

Klentschy, M. and Molina-De La Torre, E. (2002). A systemic approach to support teacher retention and renewal. In J. Rhoton and P. Bowers (Eds.). Science teacher retention and renewal, Issues in science education, Book 4. Arlington, VA: NSTA Press.

Ten Critical Elements

- ◆ **Link between preservice and actual classroom practice**
- ◆ **Institutes to deepen content understanding**
- ◆ **Opportunities to deepen pedagogical skills**
- ◆ **In-classroom support and coaching**
- ◆ **Leadership development**
- ◆ **Materials support**
- ◆ **Time for collaboration and networking**
- ◆ **Applications of technology**
- ◆ **Workshops focusing on student work as the centerpiece**
- ◆ **Opportunities to refine and reflect on instructional delivery through lesson study**

Sustained Professional Development

- ◆ University Level - Preservice
- ◆ School District Level-Inservice
 - Initial Training
 - Advanced Training
 - Lesson Study Groups
 - Institutes
 - Debriefing
- ◆ In-classroom Support
- ◆ Leadership
- ◆ Advanced Degrees

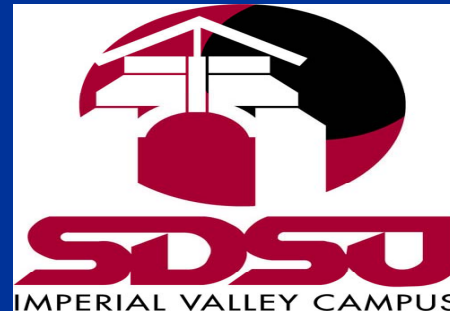




In partnership with

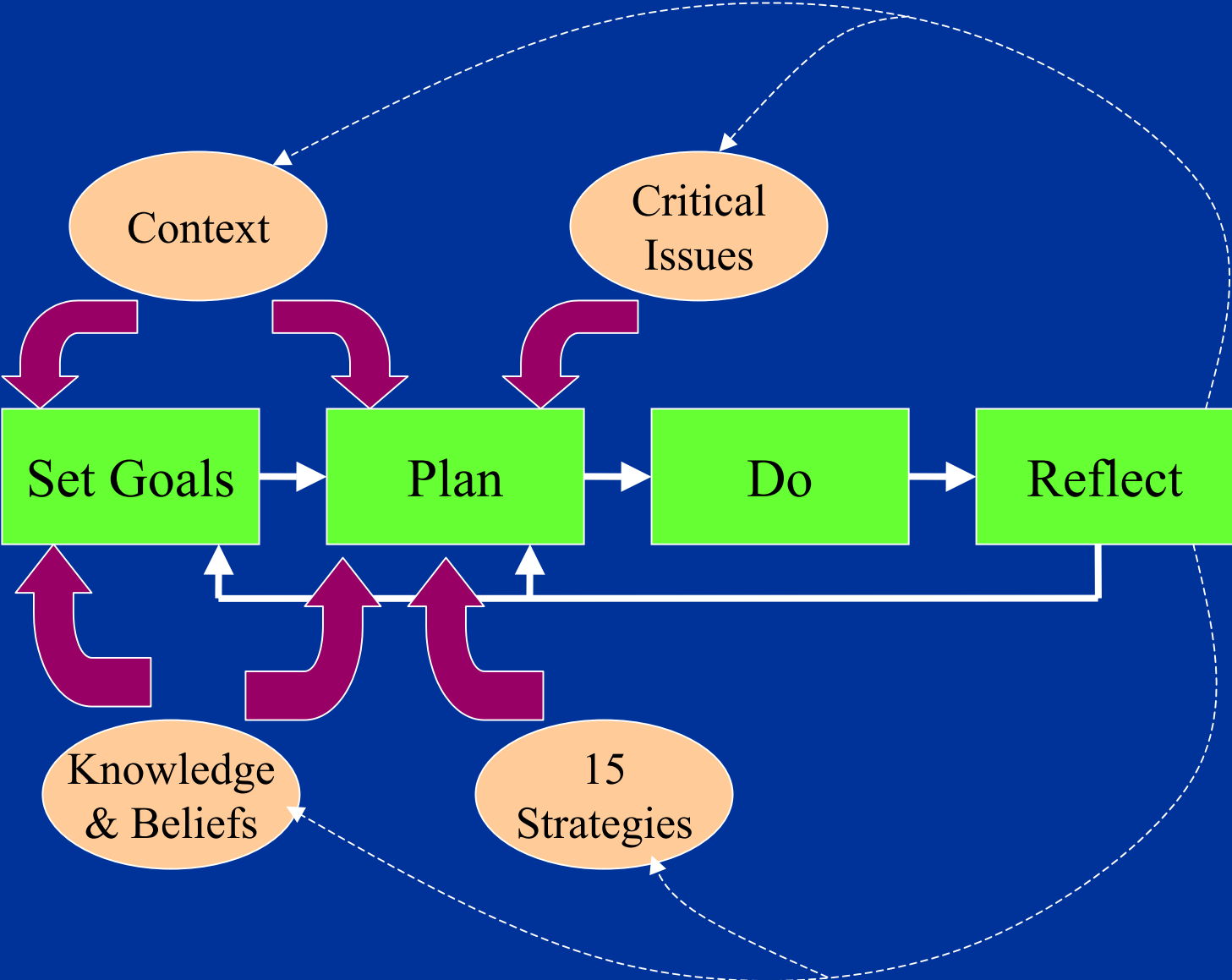


*Valle
Imperial
Project in
Science*



*Imperial Valley
Science Project*

Professional Development Design



University Level Preservice

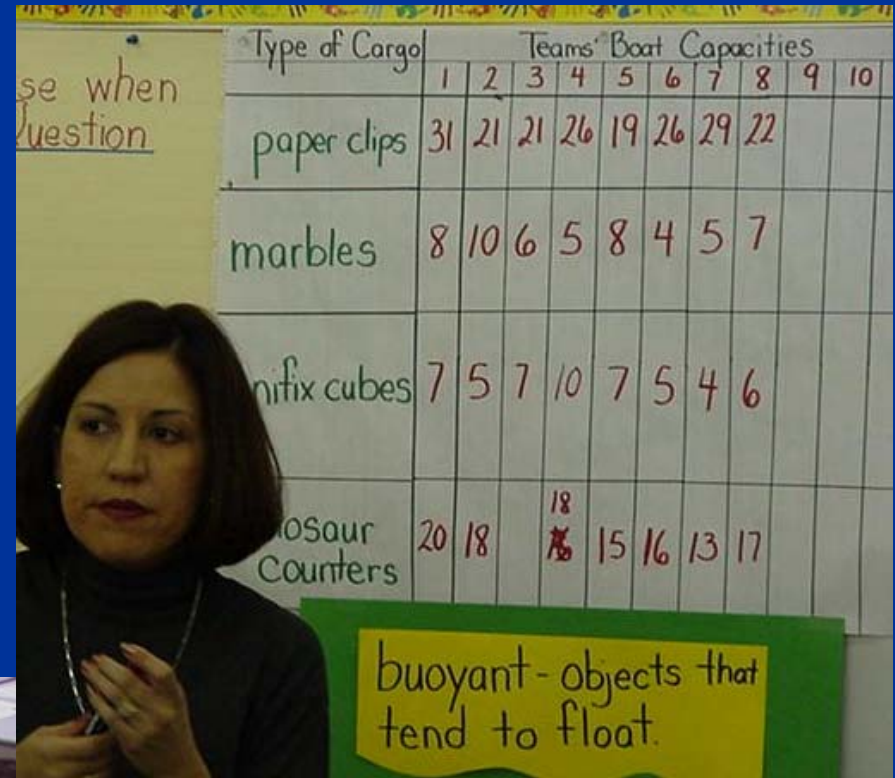
◆ Coordinated Experiences

- Content
- Pedagogy
- Student Teaching
- Supervision



School District Level Inservice Initial Training

- ◆ 2 Year Sequence
- ◆ Two Units Each Year
- ◆ Grade Level Teams
- ◆ Led by
 - Leadership Teachers
 - Scientist Volunteers
 - VIPS/CaMSP Staff



The whiteboard displays a table with the following data:

Type of Cargo	Teams' Boat Capacities									
	1	2	3	4	5	6	7	8	9	10
paper clips	31	21	21	26	19	26	29	22		
marbles	8	10	6	5	8	4	5	7		
ifix cubes	7	5	7	10	7	5	4	6		
inosaur Counters	20	18		18		15	16	13	17	

Below the table, a green sign reads: "buoyant - objects that tend to float."



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Imperial
Project in
Science

School District Level Inservice Advanced Training



- ❖ Advanced Content Training
- ❖ Study Groups
- ❖ Institutes
- ❖ Debriefing
- ❖ Literacy Links
- ❖ Assessment



SEI Classrooms

- Language in Context

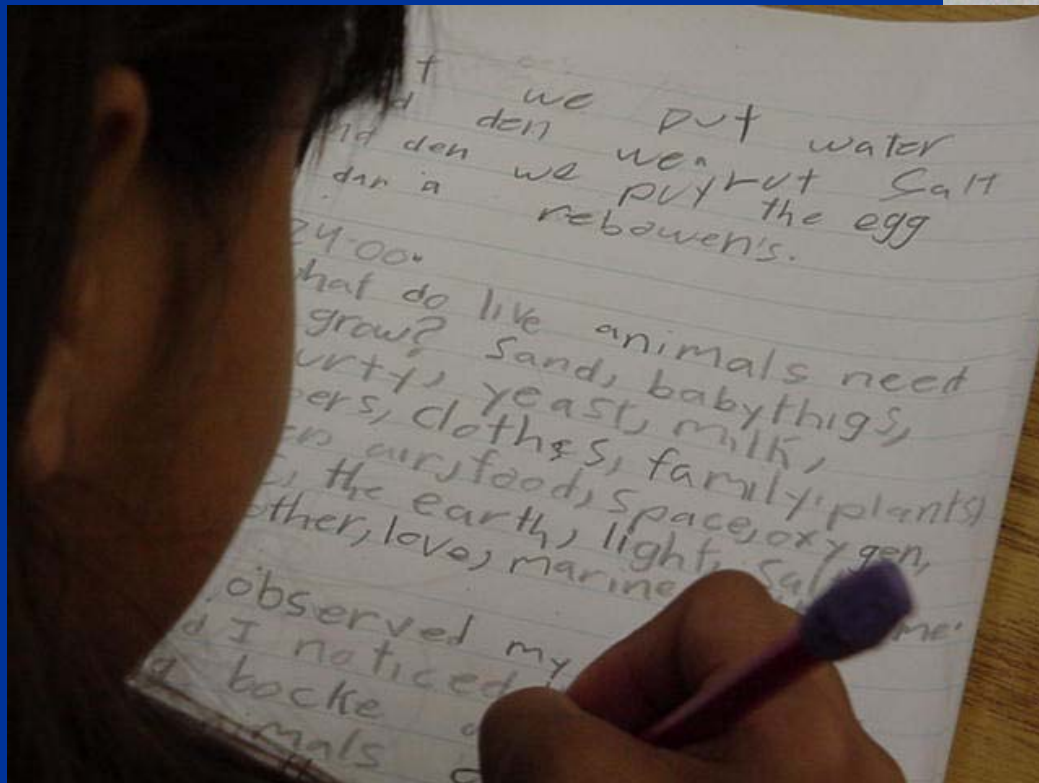
10-18-01

Today I saw a Volvox but I see black spots. Maybe is the food because they didnt move.

10-22-01

Today I'm observing the blepharisma. I expect to see a rosy, pear-shape microbe with cilia around its body.

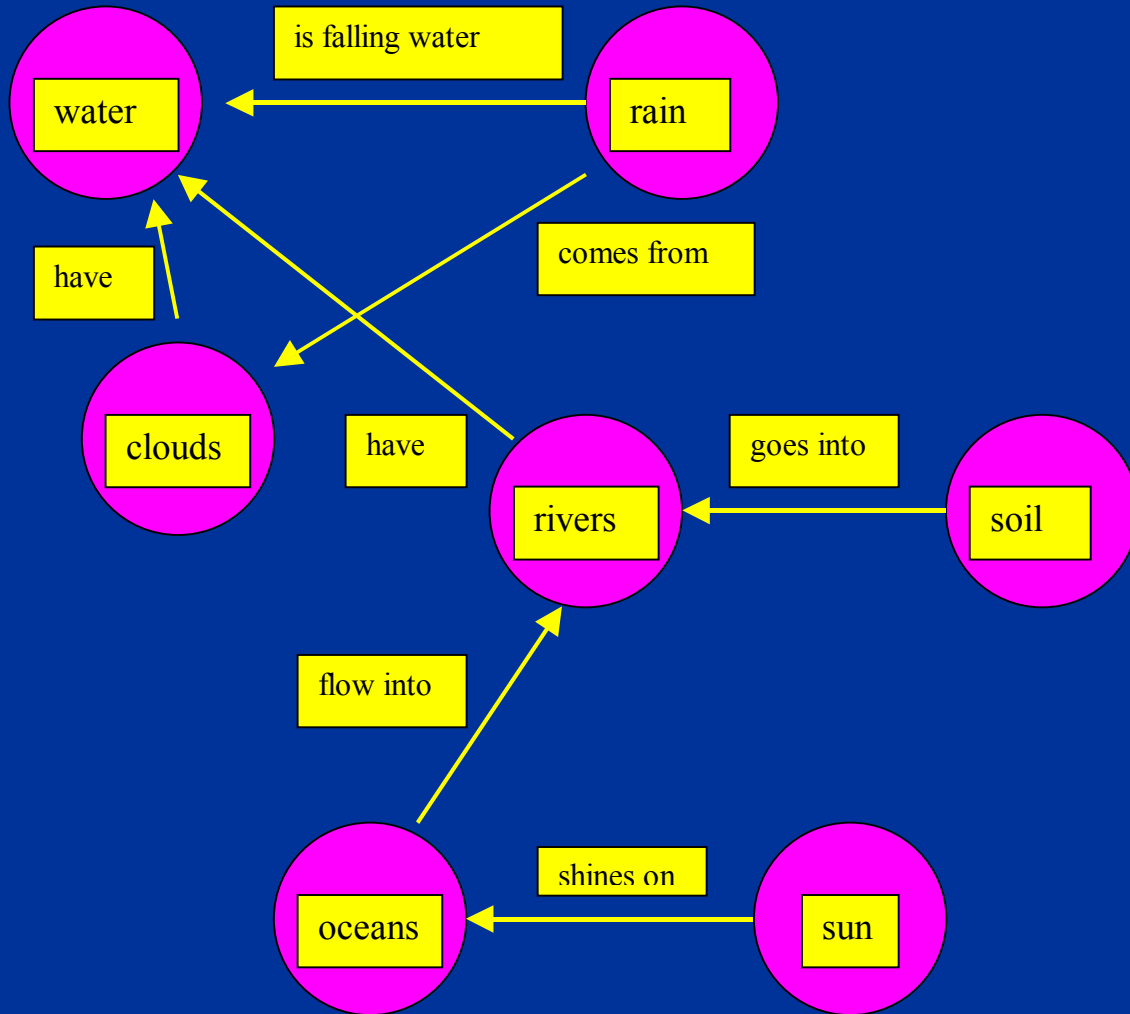
I observed a blepharisma. It looks like a shrimp almost. It's tiny and white.



Concept Mapping – Declarative Knowledge

◆ SEI Classroom

- ◆ 10 or fewer terms
- ◆ relationships
- ◆ misconceptions



LOOK, CLASS,
I'M NOT CRAZY
ABOUT THIS,
EITHER.

NO CHILD
LEFT BEHIND
MANDATE

BUT WHAT
REALLY FROSTS
ME IS WE HAVE
TO PAY FOR
THE HOOPS.



Sustained Professional Development

Valle Imperial Project in Science

- **VIPS Introduction**

Teachers will receive an overview of VIPS program, curriculum, resources available, the role of resource teacher in the classroom and the university connection. (30-45 minutes)

- **Debriefing**

Teachers will have the time to revisit VIPS units. They will have the opportunity to make any needed changes to improve the curriculum. These sessions can be organized by specific units, grade level (all units at a grade level), or by science strand (physical, life, earth). (1-3 hours)

- **Notebooks**

Teachers will study examples of student's science notebooks in order to establish and discuss common components of exemplary work and strategies for assessment. (1-3 hours)

- **Inquiry**

Part 1

Teachers will explore unusual phenomena to develop and advance the critical inquiry skill of questioning.

Part 2

Teachers will choose one of their questions developed in Part 1, and build an inquiry investigation around it.

- **Three Kinds of Hands-On Science**

Teachers will experience and discuss three methods of teaching hands-on science using the medium of spinning tops. (3 hours)

- **Process Skills**

Through hands-on experiences, teachers will identify and discuss the major science process skills. They will have an opportunity to share how these skills influence teaching and moving students toward further and deeper science understanding. (1-3 hours)

- **Standards**

Teachers will learn about the VIPS units alignment to the National and California Science Standards. (30-45 minutes)

- **Writing Prompts**

The inquiry-based hands-on activities of the VIPS program create numerous opportunities for students to write about their investigations and observations. Teachers will receive a list of suggested writing prompts for each of the VIPS units. (30-45 minutes)



Exploring inquiry using pinholes

The following will be available during

Spring 2001

- **ELD-Language Acquisition**

Teachers will have the opportunity to acquire teaching strategies in integrating ELD and VIPS units.

- **Math Integration**

Teachers will have the opportunity to acquire teaching strategies in integrating Math and VIPS units.

- **Assessment Performance**

Teachers will have the opportunity to learn the processes of implementing, scoring, calibrating, and assuring the reliability of performance and embedded science assessment.

- **Literature Integration**

Teachers will have the opportunity to review literature that can be integrated into the VIPS science units. Literature lists and additional resources compiled by VIPS staff and county educators will be made available.

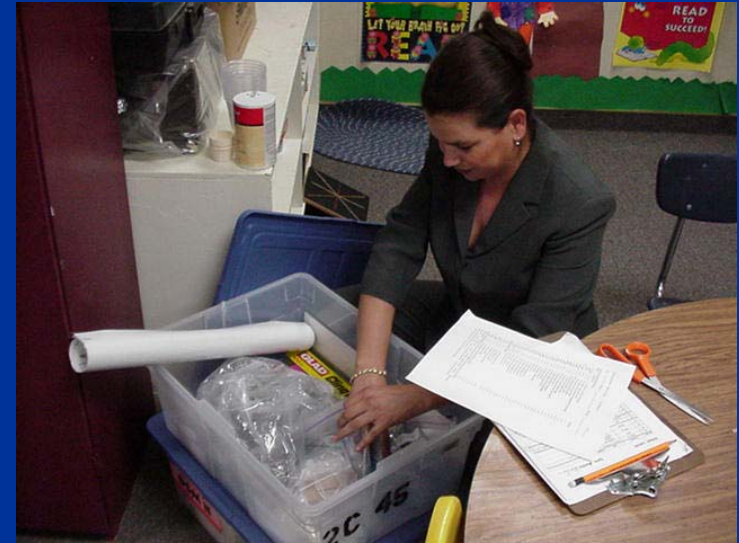
Valle Imperial Project in Science

Science & Math Resource Center
2370 Main Street
El Centro, CA 92243

Phone: (760) 353-2860
Fax: (760) 352-6429
www.ecsd.k12.ca.us/vips

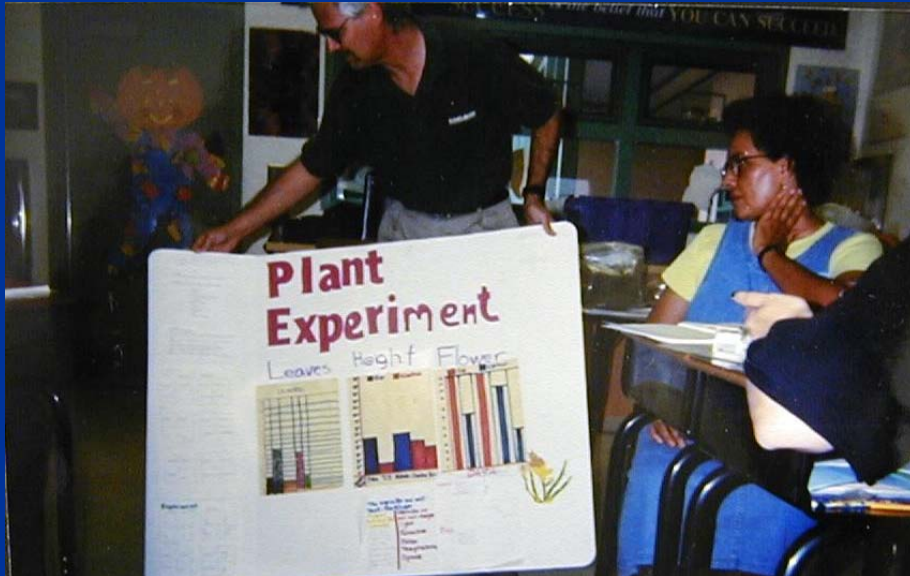
School District Level Inservice

◆ In-classroom Support



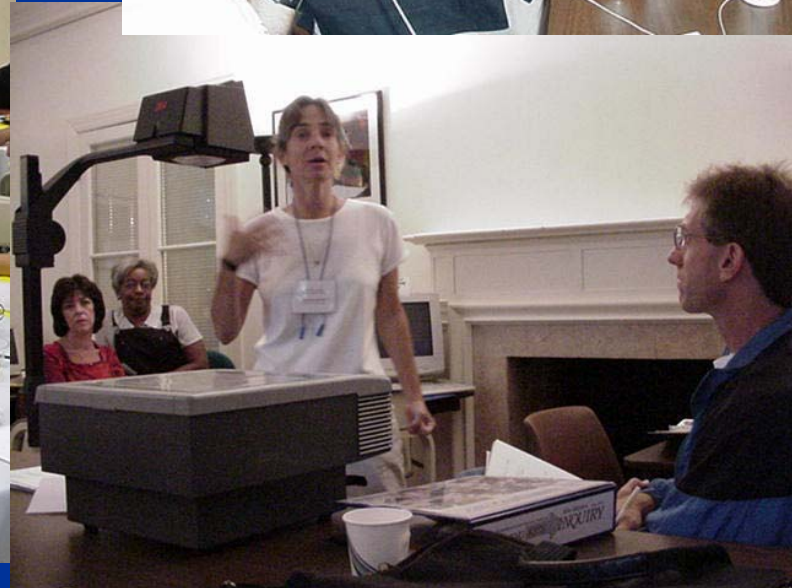
School District Level Inservice

◆ Leadership Training



Leadership Development

- Curriculum support
- Curriculum integration
- Institutes and seminars
- Monthly networking



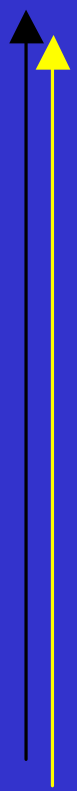
Institutes and Seminars

- Facilitation/presentation skills
- Change management
- Deepen content understanding
- Language institute
 - academic content language
 - ELD strategies
- Assessment institute
 - examining student work
 - performance tasks
- Immersion in inquiry



Development of Expertise

C
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competent

competent

competent

novice

novice

novice

Content

Pedagogy

Student
Learning

Dimensions of Teacher Development

Research-Based Evidence

A
POLICY
INFORMATION
CENTER
REPORT

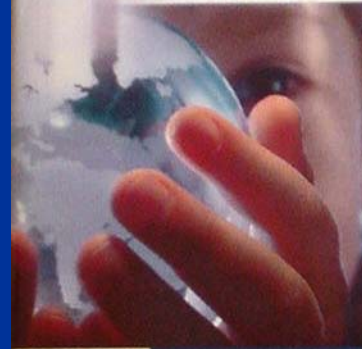
How Teaching Matters

Bringing the Classroom Back Into
Discussions of Teacher Quality




Educational
Testing Service

The Teaching Gap



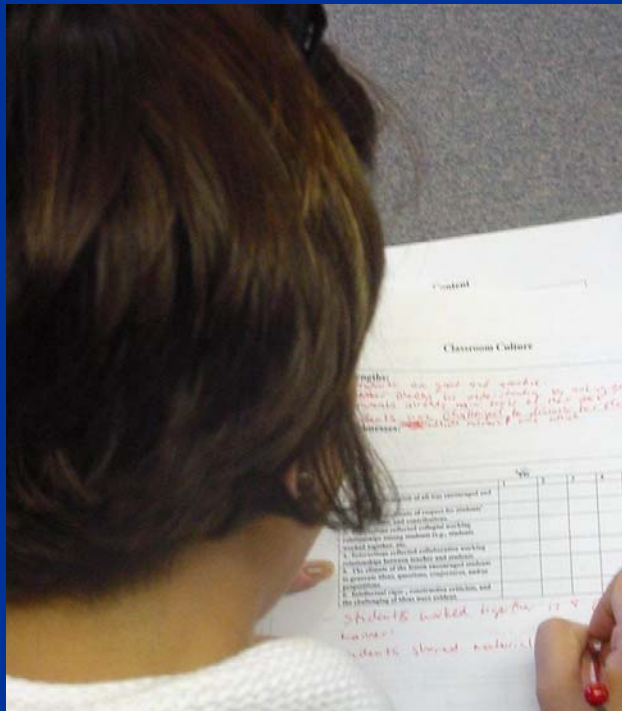
**Best Ideas from
the World's Teachers for
Improving Education in
the Classroom**

JAMES W. STIGLER
& JAMES HIEBERT

Lesson Study

◆ Focus on lesson

- Design
- Implementation
- Content
- Culture



School District Level In-Service

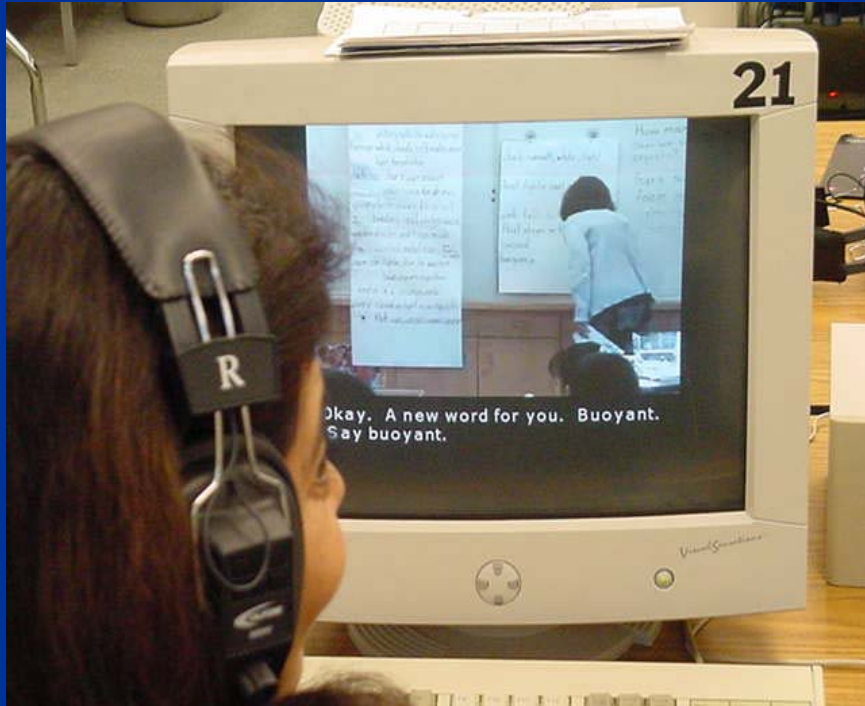


◆ Lesson Lab



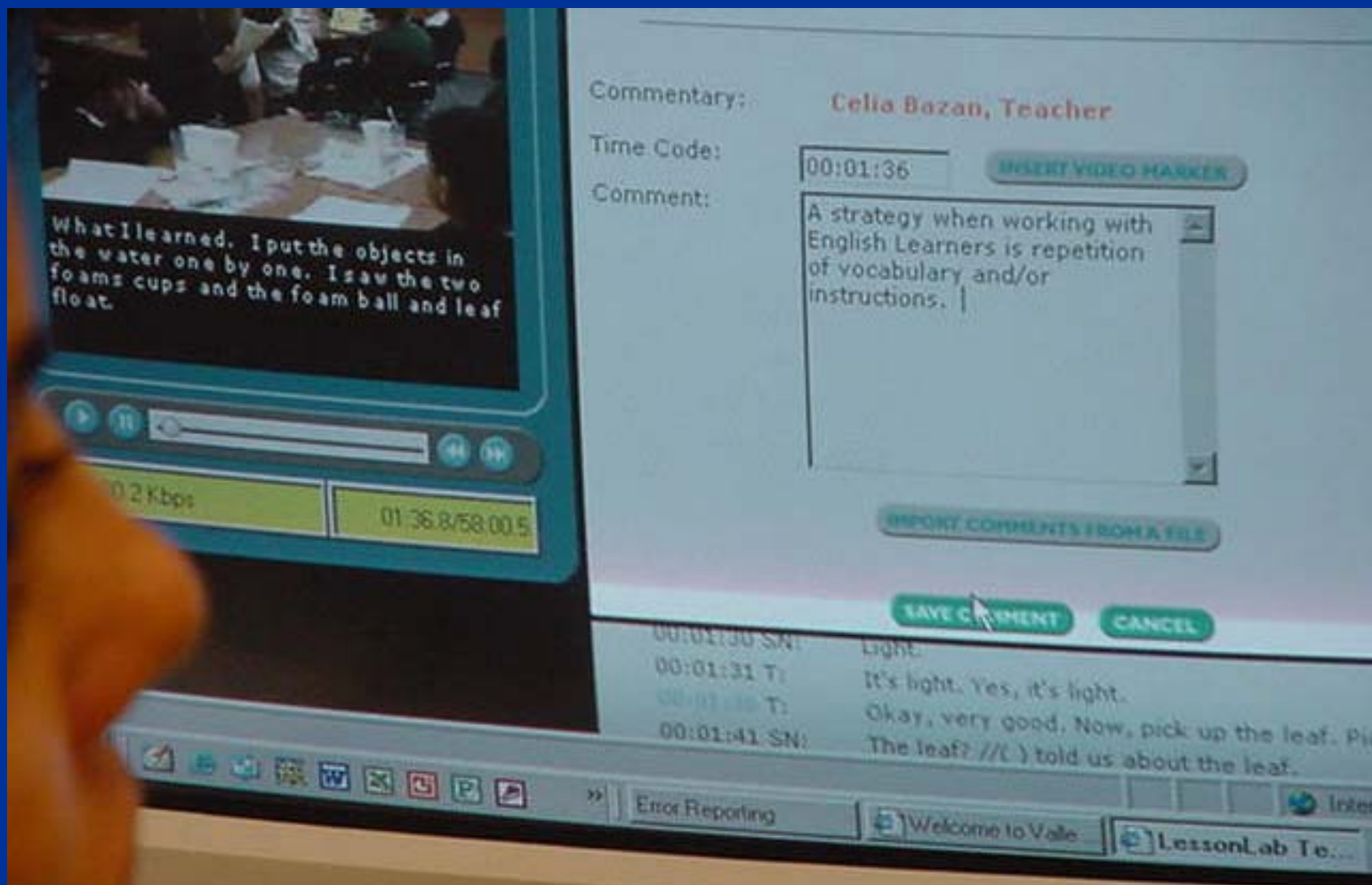
Lessonlab/Lesson Study

◆ Reflective Teaching Practices

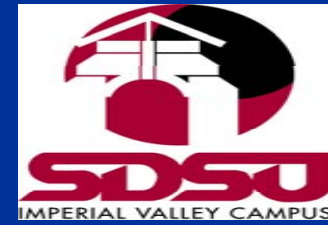


Lessonlab/Lesson Study

◆ Extend ELD Strategies



University Advanced Degrees



- ◆ Masters in Science Education
- Curriculum
- Pedagogy
- Assessment
- Content
- Field Experiences



Dry Soil Samples				Wet Soil Samples			
Sound	look	Smell	touch	touch wet soil	ball	smear	Small
a rattle	rice	glue	salt	salt	grass	rice	wet clay
small rocks	the desert	paint	playdough	fickles	balls	ice	rice
maracas	snow	paint	smoke	snare	balls	rice	wet mud
tamborine	big pieces	smoke	needles	snare	balls	rice	wet mud
a rattle	of salt	wet mud		scorpine	snare	rice	rice
tap shoes	fried rice	fish food	hot sauce	sand	wet hair	Yes	Yes
dry mud	log	frito chips	cross	burps in the road	wet paper	Yes	Yes
whispering	chocolate	paper		soft mud	wet rocks	Yes	Yes
bumping rocks	red sand	dog food		chips	playdough	Yes	Yes
marbles	brown hair	chips		wet pebbles	playdough	Yes	Yes
shells	chile powder	chips			playdough	Yes	Yes
fronque of trash	chese powder	chips			playdough	Yes	Yes
glass breaking	potting soil	dog poop	dog germs	dry mud	fruit	Yes	Yes
snake phibering	dog poop	dog poop	dog germs	sticky	wet soil	Yes	Yes
through mud	beans	dead fish	dog germs	sticks/hard	wet soil	Yes	Yes
Candy cane	sand in it	salmon	cat food	crayons	wet soil	Yes	Yes
shadows on walls	black rocks	floor	wet mud	soft	wet soil	Yes	Yes
egg white on wall	with salt	wet mud	hair	Chocolate	wet soil	Yes	Yes
small rocks	shoes/leaves				wet soil	Yes	Yes
leaf shadows	crumbled				wet soil	Yes	Yes
bees flying	hair				wet soil	Yes	Yes
shadows on wall					wet soil	Yes	Yes



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