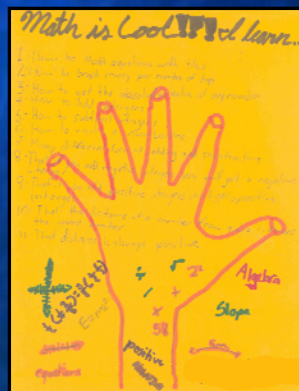

Preparing Teachers to Ensure
Mathematics Success for
Student English Language Learners

TSUS MELL Initiative

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The Hispanic Population of the U.S.

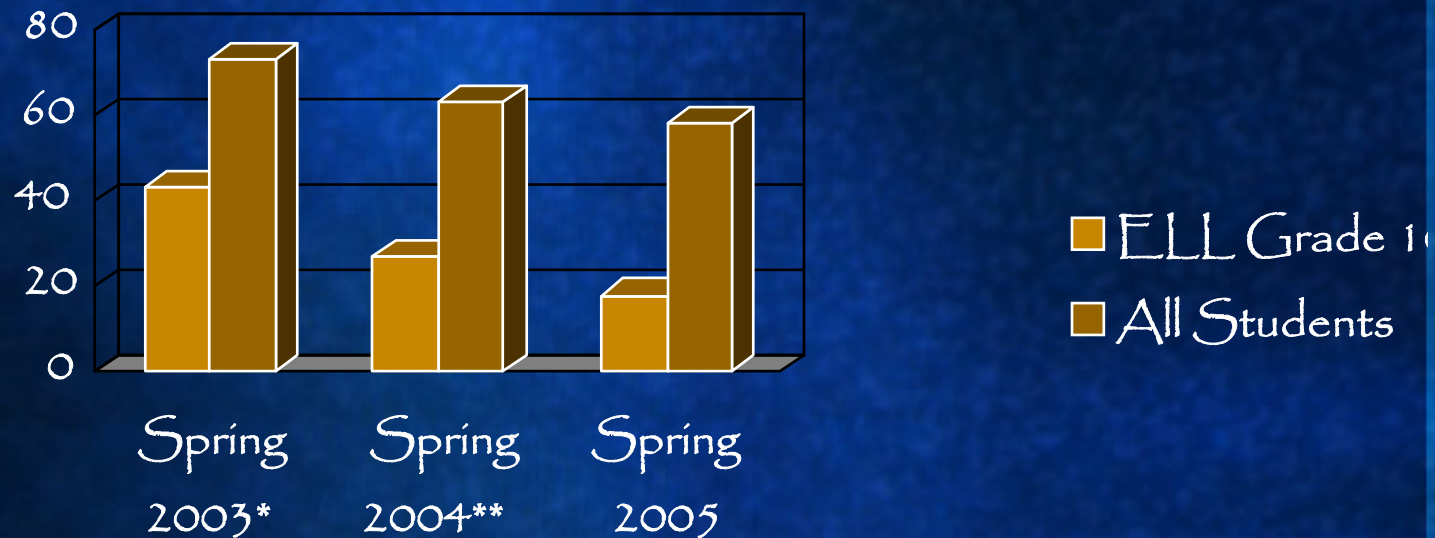
- The Hispanic population of the U.S. increased by 13.2 percent between 1990 and 2000
- The U.S. Census Bureau predicts that the Hispanic population will represent 23.3 percent of the U.S. population by 2040
- In 2002 13.3 percent of the U.S. population was Hispanic
 - 43 percent age 25 and over had not graduated from high school

The Hispanic Population of Texas

- As of August 2005, minorities represent 50.2 percent of the population of Texas
 - Hispanics are the largest minority group in Texas
- In 2000, 49.3 percent of Hispanics had graduated from high school
 - By 2040, it is predicted that 67.9 percent of Hispanics will have graduated from high school
- In 2000, 81.5 percent of the Hispanic or Latino population spoke a language other than English at home

The Mathematics Portion of TAKS

Percent of Students Who Attained Met Standard
on the Mathematics Portion of TAKS



*The Met standard was set at 2 SEM below the panels recommendation.

** The Met standard was set at 1 SEM below the panels recommendation.

The TSUS MELL Initiative

- The Texas State University System Math for English Language Learners (TSUS MELL) Initiative is a partnership with the Texas Education Agency (TEA)
- The initiative is a strand of the State of Texas Math Initiative
- The TSUS MELL Initiative aims to improve the mathematical success of ELL by increasing the effectiveness of instruction for these students

The TSUS MELL Initiative

- Five focus areas of the TSUS MELL
 - Identify currently available instructional tools and develop instructional tools and materials
 - Create professional development for teachers of ELL
 - Conduct classroom-based research
 - Extend classroom best practices to teacher preservice programs
 - Guide policymakers

Objectives and Questions

Objective:

- Determine the effect of the Mathworks/ACCIÓN Professional Development Model on the content knowledge of ELL students

Question:

- Does the Mathworks/ACCIÓN Professional Development Model for teaching increase content knowledge of ELL students?

Summer Teacher Content Pretest Reliability

Module: ALPHA, Alpha Reliability

Alpha: 0.8860

Standardized alpha:0.8905

Number of obs: 23

Scale mean: 19.870

Item	Mean	Standard Deviation
■ PRCONT	2.435	1.996
■ PRCONT2	1.304	1.845
■ PRCONT3	2.913	1.443
■ PRCONT4	0.870	1.576
■ PRCONT5	0.609	1.158
■ PRCONT6	0.826	1.614
■ PRCONT7	0.478	1.275
■ PRCONT8	1.826	1.403
■ PRCONT9	2.565	1.619
■ PRCONT10	2.783	1.731
■ PRCONT11	0.522	0.947
■ PRCONT12	0.435	1.199
■ PRCONT13	2.304	1.893

Summer Teacher Content Posttest Reliability

Module: ALPHA, Alpha Reliability

Alpha: 0.8341

Standardized alpha:0.8163

Number of obs: 23

Scale mean: 31.609

Standard

Item	Mean	Deviation
■ POCNT1	3.304	1.550
■ POCNT2	2.217	1.882
■ POCNT3	3.087	1.311
■ POCNT4	1.652	1.968
■ POCNT5	1.739	1.657
■ POCNT6	1.957	1.965
■ POCNT7	2.000	2.000
■ POCNT8	3.391	1.196
■ POCNT9	3.739	0.689
■ POCNT10	3.130	1.424
■ POCNT11	1.565	1.754
■ POCNT12	1.043	1.796
■ POCNT13	2.783	1.882

Summer Teacher Content t-test

Module: TTEST, Paired Differences t-tests

FILTER: None

PRCONTSC \geq Lower 95%: 15.007
POCONTSC \geq Upper 95 %: 8.471

	N	Mean	S.D.		
PRCONTSC:23		19.870	13.050	T: 7.450	R:0.8258
POCONTSC:23		31.609	12.496	DF:22	DF:21
Difference:		11.739	7.557	P:0.0000	P:0.0000

Summer Teacher Efficacy t-tests

Personal Score

PPMT Lower 95 %: 12.202
OPMT Upper 95 %: 4.146

	N	Mean	S.D.		
PPMT:	23	47.391	9.114	T:4.208	R:0.3159
OPMT:	23	55.565	6.345	DF:22	DF:21
Difference:		8.174	9.316	P:0.0004	P:0.1420

Outcome Score

PMT0 Lower 95 %: 3.588
OMT0 Upper 95 %: 0.064

	N	Mean	S.D.		
PMT0:	23	32.739	5.293	T:2.149	R:0.6814
OMT0:	23	34.565	4.869	DF:22	DF:21
Difference:		1.826	4.075	P:0.0429	P:0.0003

Summer Teacher Efficacy t-tests

Module: TTEST, Paired Differences t-tests

Combined Scores

PREFSCR Lower 95 %: 14.956

POEFSCR Upper 95%: 5.913

N Mean S.D.

PREFSCR: 23 78.043 10.973 T: 4.786 R:0.4462

POEFSCR: 23 88.478 8.490 DF: 22 DF:21

Difference: 10.435 10.457 P: 0.0001 P:0.0328

TSUS MELL

TxS Math Impacts for FY2005

- ★ In Brownsville during the Junior Summer Math Camp 40 teachers and 254 students, in grade 4 and above, studied math in two camps lasting two weeks each.
- ★ Teacher overall content knowledge increase was 11.74 with a p-value of 0.0000
- ★ Student overall content knowledge increase for level I (213 students) was 3.35 with a p-value of 0.0000



Data Collection

- Students in the study were given pretests and posttests that measured mathematics content knowledge
- Audio and video interviews were conducted with some of the teachers and students participating in the study

Does the Mathworks/ACCIÓN Professional Development Model for Teaching Increase Content Knowledge of ELL Students?

- The content tests were reliable measures of the students' content knowledge
- The tests provided evidence of significant change in student content knowledge
- Qualitative data from this group of students indicate that their attitude and efficacy increased towards mathematics

Summer Mathcamp 2005

Student Content Data

All	N	Pre-Test	Post-Test	Gain	P-value
Level One	391	9.6266	13.2506	3.624	0
Level Two	177	18.3898	26.1073	7.7175	0
Level Three	100	29.73	34.74	5.01	0
San Marcos					
Level One	71	10.4931	17.0141	6.5211	0
Level Two	22	16.2273	23.7273	7.5	0
Level Three	32	34.875	36.0625	1.1875	0.502
Brownsville					
Level One	213	9.6338	12.9859	3.3521	0
Level Two	41	22.9512	24.878	1.9268	0.023
McAllen					
Level One	57	8.9649	17.2982	8.3333	0
Level Two	95	18.0947	29.1053	11.0105	0
Level Three	66	27.1364	35.1515	8.0152	0

TSUS MELL Overview

- ✦ Strand of the State of Texas Inter-Systems Mathematics Initiative
- ✦ 5 year system wide effort funded by TEA, directed by Dr. Ken Craycraft, Vice Chancellor of the TSUS and Dr. Leslie Huling, Director of the Education Policy Implementation Center (EPIC)
- ✦ Texas State-San Marcos Math program, directed by Dr. Joyce Fischer, produces research based projects that work with in-service and pre-service teachers in partnership with the University of Texas, Brownsville (UTB-TSC) and Brownsville Independent School District

Next Steps:

1. A cognate that leads to a MELL specialization for in-service teachers
2. A curriculum, integrated with MELL best practices and lessons learned, designed for pre-service teachers
3. A series of workshops delivered statewide through regional Education Service Centers (ESCs)
4. Outreach and community awareness programs for the general public
5. Identify future funding sources to build on previous accomplishments

Improve Mathematics Instruction for English Language Learners (ELL)

- ★ Work with the established Mathworks professional development model
- ★ Provide resources and training to teachers of ELL students
- ★ Refine the professional development model based on research data



TSUS MELL

TxS Math Accomplishments for FY2005

- ★ Collected extensive qualitative and quantitative data
 - a) Conducted 40 teacher and 40 student interviews in Spanish and English
 - b) Surveyed math attitude, learning style, and teaching style for over 300 teachers and students
 - c) Pre- and post-tested math content and self-efficacy for over 300 teachers and students



- d) Formulated a matrix of traits and characteristics necessary to ensure mathematics success for English Language Learners (ELL)
- e) Derived a matrix of traits and characteristics necessary for conducting successful workshops for teachers of ELL
- f) Teamed with TSUS colleagues to produce Classroom Practices Framework (CPF) as a best practice model for teachers of ELL
- g) Analyzed 12 Professional Development Models (PDMs), currently in use in Texas, in general and relative to the CPF
- h) Developed ACCIÓN Plan (Active Curriculum & Content: Involving, Orchestrating, and Networking) PDM for ELL



Year 2 of MELL

- ✪ Expand the model to include
 - Control group
 - Year 1 model treatment group
 - Year 2 refined model treatment group
- ✪ Explore and analyze patterns in the data
- ✪ Refine the model based on new research data
- ✪ Critical Campuses Partnership



Closing the Gaps for English Language Learners (ELL) in Mathematics Learning by Improving In-Service Teacher Professional Development Thus Increasing Teacher Content, Pedagogy, and Methods Knowledge