

MELL

Mathematics for English Language Learners

Contemporary Practices in Math Preservice Education

Angelo State University

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Genuine Education

Math Education Programs



- Elementary, middle school, and secondary certification
- Texas State University System institutions
 - Angelo State University
 - Lamar University
 - Sam Houston State University
 - Sul Ross State University
 - Texas State University at San Marcus

Certifications Examined



- 8-12 Math
- 4-8
 - 4-8 Math
 - 4-8 Math/Reading
 - 4-8 Math/Science
 - 4-8 Generalist
 - 4-8 Bilingual Specialist
 - 4-8 Generalist/Special Education
- EC-4
 - EC-4 Generalist
 - EC-4 Generalist/Special Education
 - EC-4 English as a Second Language
 - EC-4 Bilingual Generalist
- EC-8
 - EC-4 Generalist and/or 4-8 Math
- EC-12
 - EC-12 Special Education



Data Collected

- Interviews – Websites – Catalogs – Surveys
- Mathematics / Education course requirements
- Teacher education experiences
 - professional knowledge courses
 - early field experiences
 - student teaching

[Interviews



Mathematics / Education Courses

- Requirements for each certification
- ELL issues addressed in any way
- Elective courses addressing ELL

[Interviews



Teacher education experiences

- Required field experiences
- Optional field experiences available
- Field experiences addressing ELL



Interviews

ELL Practices / Projects

- University: Currently / Planned
- Area schools: Currently / Planned



[Interviews

Local Area Schools

- Concerns with ELL issues
- Needs for ELL students
- Languages



University Course Requirements

Type of Certification	Mathematics Course Requirements	Teacher Education Course Requirements
8-12 Math	A Survey of Mathematics with Applications Abstract Algebra Analytic Geometry Calculus I Calculus II. Calculus III College Algebra Introduction to Problem Solving Linear Algebra Plane Trigonometry Probability and Statistics I ----- Analysis Or Topology	Curriculum & Instruction (Pedagogy) Secondary School Organization and Curriculum Teaching Techniques in the Secondary School Teaching Techniques in the Secondary School*(same name but different course) Early Childhood Educational Psychology Adolescent Development Language & Literacy Reading Reading in the Secondary School Content Areas Special Education Student Teaching Supervised Teaching in the High School



University Course Requirements

Certification	Math Courses	Teacher Ed Courses
8-12 Math	10-12 Courses	<p>C & I (Pedagogy) 2-4 Courses</p> <p>Early Childhood 0 Courses</p> <p>Ed Psychology 1 Course</p> <p>Language & Literacy 0 Courses</p> <p>Reading 1 Course</p> <p>Special Education 0 Courses</p> <p>Student Teaching 1-2 Courses</p>



University Course Requirements

Certification	Math Courses	Teacher Ed Courses
4-8	3-14 Courses	<p>C & I (Pedagogy) 4-7 Courses</p> <p>Early Childhood 0-1 Courses</p> <p>Ed Psychology 1-2 Courses</p> <p>Language & Literacy 0-4 Courses</p> <p>Reading 2-7 Courses</p> <p>Special Education 0-1 Courses</p> <p>Student Teaching 1 Course</p>



University Course Requirements

Certification	Math Courses	Teacher Ed Courses
EC-4	3-4 Courses	<p>C & I (Pedagogy) 4-8 Courses</p> <p>Early Childhood 0-6 Courses</p> <p>Ed Psychology 1-2 Courses</p> <p>Language & Literacy 0-6 Courses</p> <p>Reading 3-6 Courses</p> <p>Special Education 0-6 Courses</p> <p>Student Teaching 1-2 Courses</p>



University Course Requirements

Certification	Math Courses	Teacher Ed Courses
EC-8	8 Courses	<p>C & I (Pedagogy) 6 Courses</p> <p>Early Childhood 3 Courses</p> <p>Ed Psychology 1 Course</p> <p>Language & Literacy 0 Courses</p> <p>Reading 4 Courses</p> <p>Special Education 1 Course</p> <p>Student Teaching 2 Courses</p>



University Course Requirements

Certification	Math Courses	Teacher Ed Courses
EC-12	3-6 Courses	<p>C & I (Pedagogy) 4-6 Courses</p> <p>Early Childhood 1-2 Courses</p> <p>Ed Psychology 1 Course</p> <p>Language & Literacy 0-1 Courses</p> <p>Reading 1-5 Courses</p> <p>Special Education 6-8 Courses</p> <p>Student Teaching 1-2 Courses</p>

Field Experiences



Type of Certification	Mathematics Courses	Teacher Education Courses
8-12 Math		<p>Curriculum & Instruction (Pedagogy) Secondary School Organization and Curriculum (10 hrs) Teaching Techniques in the Secondary School (10 hrs)</p> <p>Early Childhood</p> <p>Educational Psychology Adolescent Development (10 hrs)</p> <p>Language & Literacy</p> <p>Reading Reading in the Secondary School Content Areas (10 hrs)</p> <p>Special Education</p> <p>Student Teaching Supervised Teaching in the High School</p>



Field Experience Requirements

Certification	Math Courses	Teacher Ed Courses
8-12 Math	0 Courses	C & I (Pedagogy) 2-3 Courses Early Childhood 0 Courses Ed Psychology 0-1 Courses Language & Literacy 0 Courses Reading 0-1 Courses Special Education 0 Courses Student Teaching 1-2 Courses



Field Experience Requirements

Certification	Math Courses	Teacher Ed Courses
4-8	0-3 Courses	<p>C & I (Pedagogy) 1-4 Courses</p> <p>Early Childhood 0-1 Courses</p> <p>Ed Psychology 0-1 Courses</p> <p>Language & Literacy 0-2 Courses</p> <p>Reading 0-3 Courses</p> <p>Special Education 0-1 Courses</p> <p>Student Teaching 1-2 Courses</p>



Field Experience Requirements

Certification	Math Courses	Teacher Ed Courses
EC-4	0-2 Courses	<p>C & I (Pedagogy) 1-4 Courses</p> <p>Early Childhood 0-4 Courses</p> <p>Ed Psychology 0-1 Courses</p> <p>Language & Literacy 0-5 Courses</p> <p>Reading 0-3 Courses</p> <p>Special Education 0-5 Courses</p> <p>Student Teaching 1-2 Courses</p>



Field Experience Requirements

Certification	Math Courses	Teacher Ed Courses
EC-8	0 Courses	<p>C & I (Pedagogy) 4 Courses</p> <p>Early Childhood 2 Courses</p> <p>Ed Psychology 1 Course</p> <p>Language & Literacy 0 Courses</p> <p>Reading 3 Courses</p> <p>Special Education 1 Courses</p> <p>Student Teaching 2 Courses</p>



Field Experience Requirements

Certification	Math Courses	Teacher Ed Courses
EC-12	0-2 Courses	<p>C & I (Pedagogy) 2-4 Courses</p> <p>Early Childhood 0-1 Courses</p> <p>Ed Psychology 0-1 Courses</p> <p>Language & Literacy 0 Courses</p> <p>Reading 0-3 Courses</p> <p>Special Education 0-5 Courses</p> <p>Student Teaching 1-2 Courses</p>



Preliminary Observations

8-12 Math

- 8-12 mathematics teachers are being trained like professional mathematicians.
- There are no field-experience requirements in the mathematics courses.
- Although all programs require content area reading and a methods course, none are specifically targeting reading for mathematics.
- No special education courses are required.
- From the course descriptions, there is no specified ELL training in any 8-12 program.



Preliminary Observations

4-8

- 4-8 programs are new and under revision with little consistency in the math curriculum.
- 4-8 Generalist & Bilingual Specialist require 3-6 math courses. Teachers may not have sufficient preparation to teach math in middle school.
- Some programs require content area reading. None are specifically targeting reading for math.
- From the course descriptions, there is no specified ELL training in most 4-8 programs.
- Mathematics courses for 4-8 certification do not have field experience requirements.



Preliminary Observations

EC-4

- Elementary trained teachers take the mathematics core requirement of College Algebra and only two foundations of mathematics courses. There are no field-experience requirements in the mathematics courses.
- Although all programs require reading courses, none are specifically targeting reading for mathematics.
- Mathematics courses for elementary certification do not have field experience requirements.

Preliminary Conclusions



Certification programs may be improved by including:

- Expanded training in planning and adapting lessons to directly address the needs of diverse learners, particularly ELL students (TExES PPR for all certifications, Domain I, Competency 2)
- A special education course to diagnose and address special populations including ELL students
- Additional mathematics courses for elementary certification



Preliminary Conclusions

Certification programs may be improved by including:

- Required field experiences in mathematics courses
- Modeling with technology, manipulatives, graphics, visual demonstrations, kinesthetic activities, writing, and verbal descriptions for secondary mathematics courses and College Algebra
- Activities designed to rewrite each Mathematics TEKS objective into several key statements that can be easily understood by ELL students

Contemporary Practices -- Year 2

- **Texas A&M University System**
 - **Texas A&M University**
 - **Prairie View A&M University**
 - **Tarleton State University**
 - **Texas A&M International University**
 - **Texas A&M University – Commerce**
 - **Texas A&M University – Corpus Christi**
 - **Texas A&M University – Kingsville**
 - **Texas A&M University – Texarkana**
 - **West Texas A&M University**



Contemporary Practices -- Year 2

- Other Specially Selected Universities
 - University of Texas -- Pan American
 - University of Texas – El Paso
 - Abilene Christian University
 - Howard Payne University
 - Texas Tech University
 - Houston University